VOLUME XLIX NUMBER SIX

# THE NATIONAL GEOGRAPHIC MAGAZINE

JUNE, 1926

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**16 PAGES IN FULL COLOR**

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COLONEL FITZHUGH LEE MINNIGERODE

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With 96 Illustrations GEORGES-MARIE HAARDT

PUBLISHED BY THE
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HUBBARD MEMORIAL HALL
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TO carry out the purposes for which it was founded thirty-eight years ago, the National Geographic Society publishes this Magazine. All receipts are invested in the Magazine itself or expended directly to promote geographic knowledge.

ARTICLES and photographs are desired. For material which the Magazine can use, generous remuneration is made. Contributions should be accompanied by an addressed return envelope and postage.

IMMEDIATELY after the terrific eruption of the world's largest crater, Mt. Katmai, in Alaska, a National Geographic Society expedition was sent to make observations of this remarkable phenomenon. Four expeditions have followed and the extraordinary scientific data resulting given to the world. In this vicinity an eighth wonder of the world was discovered and explored—"The Valley of Ten Thousand Smokes," a vast area of steaming, spouting fissures. As a result of The Society's discoveries this area has been created a National Monument by proclamation of the President of the United States.

AT an expense of over $50,000 The Society sent a notable series of expeditions into Peru to investigate the traces of the Inca race. Their discoveries form a large share of our knowledge of a civilization waning when Pizarro first set foot in Peru.

THE Society also had the honor of subscribing a substantial sum to the expedition of Admiral Peary, who discovered the North Pole.

NOT long ago The Society granted $25,000, and in addition $75,000 was given by individual members to the Government when the congressional appropriation for the purpose was insufficient, and the finest of the giant sequoia trees of California were thereby saved for the American people.

THE Society is conducting extensive explorations and excavations in northwestern New Mexico, which was one of the most densely populated areas in North America before Columbus came, a region where prehistoric peoples lived in vast communal dwellings and whose customs, ceremonies, and name have been engulfed in an oblivion.

THE Society also is maintaining expeditions in the unknown area adjacent to the San Juan River in southeastern Utah, and in Yunnan, Kweichow, and Kansu, China—all regions virgin to scientific study.

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# The Joyous Satisfaction That Only Cadillac Can Give

The young man who drove his first car yesterday is no fresher in his enthusiasm than the owner of a new, 90-degree, eight-cylinder Cadillac who has driven the Cadillac year after year for a dozen years.

The one extracts joy from all the delusions of inexperience—the other from the ripened realization that all of his experience has brought to him nothing so fine as this new, 90-degree, eight-cylinder Cadillac.

The Cadillac market is bubbling over everywhere with delight in this new expression of Cadillac fitness for fine manufacture—and growing in sales volume as no Cadillac before ever inspired it to grow. New hosts of owners are coming to the 90-degree Cadillac because a new buying spirit is abroad in the land—a spirit which has weighed its own less happy experience against the everlasting satisfaction of the Cadillac owner—and found that other experience lacking.

It seems strange to say at this late date that Cadillac has come into its own—but it is true because the experience of years has shown to thousands that the oft repeated promise of equality with Cadillac has not been fulfilled.

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bigger volume without distortion

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*One of these tubes, in the last audio stage, uses extra batteries and gives greater volume of tone.*

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You would not use any but a MAZDA lamp. Why use any but an RCA Radiotron? They are made by the same skilled workers, backed by the same research laboratories. But the Radiotron is far more delicate to make. Be sure all the tubes in your set are Radiotrons. And keep a spare handy.

RADIO CORPORATION OF AMERICA
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RCA Radiotron

MADE BY THE MAKERS OF RADIOLAS

# Why are 1923 cars worth so much less than 1924 cars?

THE market value of the average 1923 model is far below that of the 1924 model. Between the cars of those years there is a much greater difference in value than one year's difference in date of production usually means.

The answer, of course, is that 1924 saw the general adoption of four-wheel brakes and balloon tires, practically obsoleting models not so equipped. History is beginning to repeat itself between the cars of 1926 conventional chassis design and those of the years to come.

The advanced engineering ushered in by The NEW STUTZ Safety Chassis, achieving a much lower center of gravity and thus accomplishing greater safety and roadability, has set new standards.

The basic changes in chassis construction, inaugurated by The NEW STUTZ, will be copied by manufacturers of other fine cars. Then the market or trade-in value of those models built on old conventional lines will suffer, just as that of 1923 cars has suffered in comparison with 1924 four-wheel braking, balloon-tire equipped cars.

Protect your investment by buying a car that will be modern and up-to-date two years from now.

Even though you may not be able to get immediate delivery of a NEW STUTZ, remember that in buying this car today you are really getting an automobile that is years in advance of current conventional design.

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*—yet providing full road clearance and headroom*

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*—giving greater safety, comfort and roadability*

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*—permitting lowered body; it improves with use*

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*—novel design; smooth, flexible, vibrationless*

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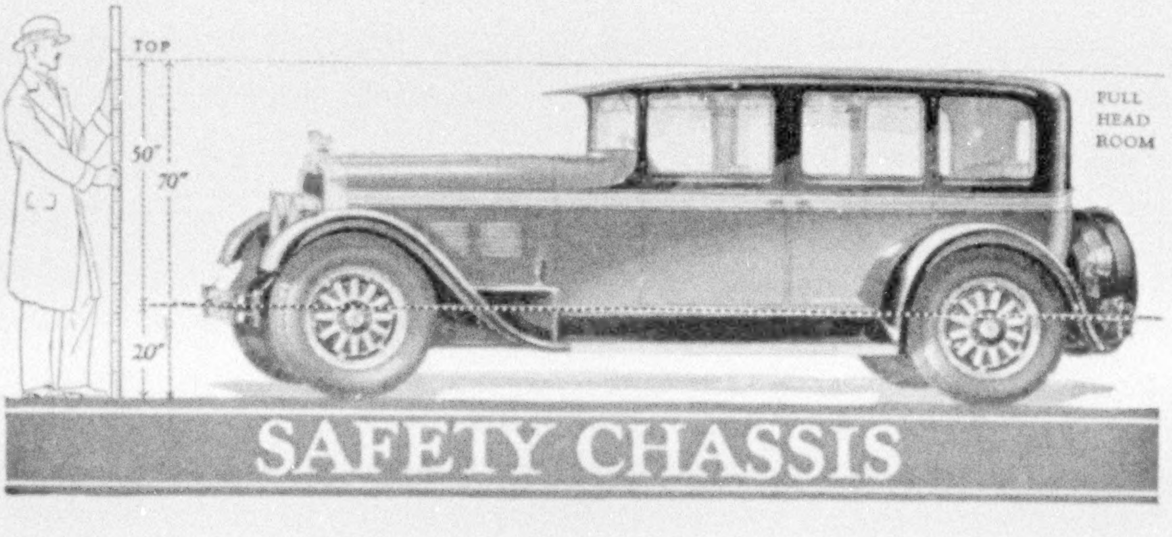

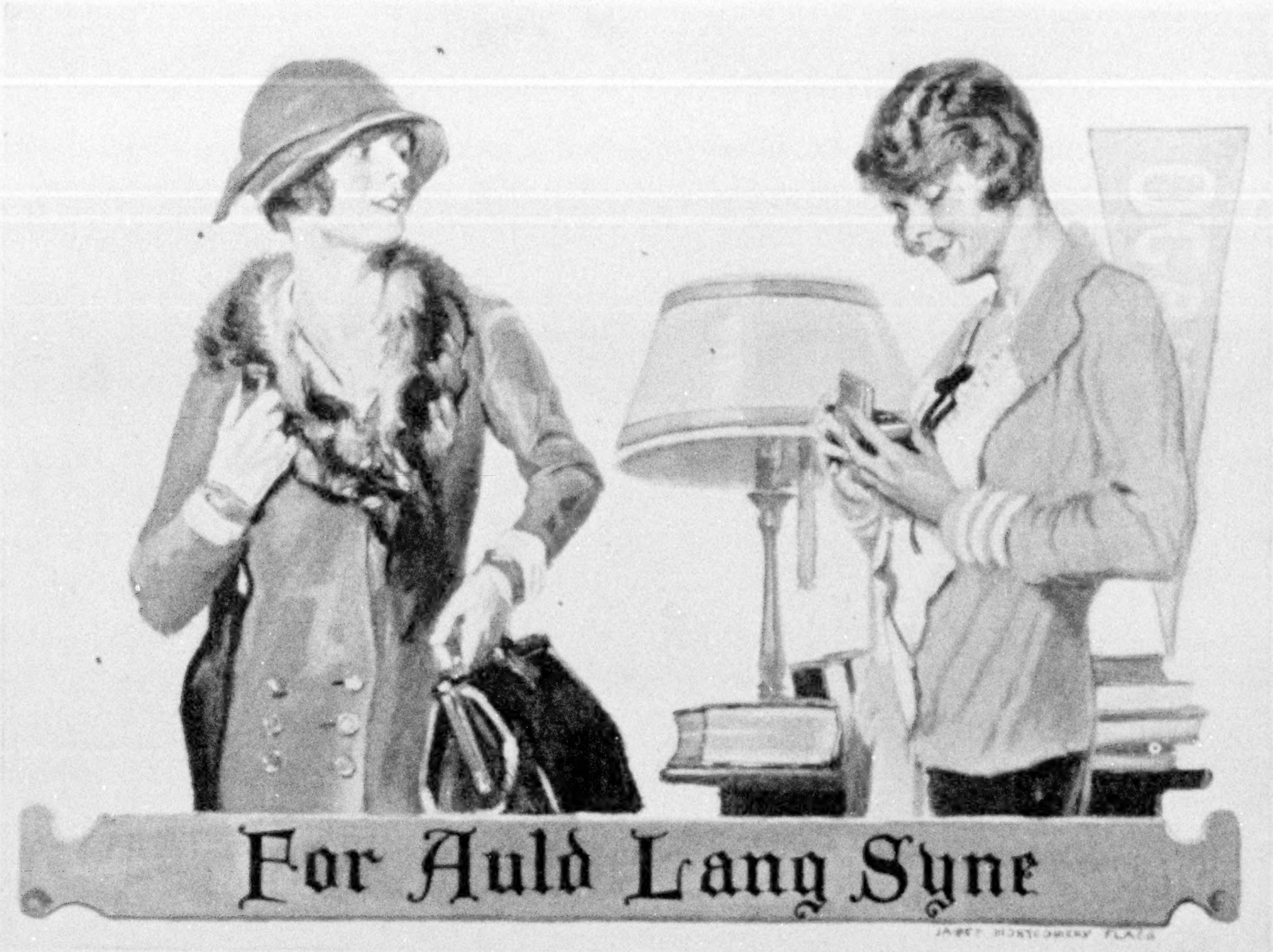

## THAT SCHOOL-DAY FRIENDSHIP—LET THE JEWELER HELP YOU PERPETUATE IT

∾ ∾ ∾

THIS month more than a hundred thousand boys and girls will graduate from the colleges and universities of America.

For four years, these boys and girls have lived in a world of their own, forming friendships as close and true as life can develop.

To these friendships, Commencement Day often means the "parting of the ways" . . . the interruption of sympathetic ties which later years may never supplant.

But need the parting mean the end of these friendships?

Not if pleasant memories are kept alive with tokens that serve as lasting reminders of delightful Alma Mater days. Your jeweler is headquarters for such enduring reminders—for "Gifts That Last" like the sentiment they commemorate.

They need not be expensive gifts. But they should be durable and serviceable, like friendship itself.

Whatever you would say to him or her, at the parting of treasured school-day comradeships, should be said for a lifetime.

So say it from the jeweler's stock—with "Gifts That Last."

ELGIN

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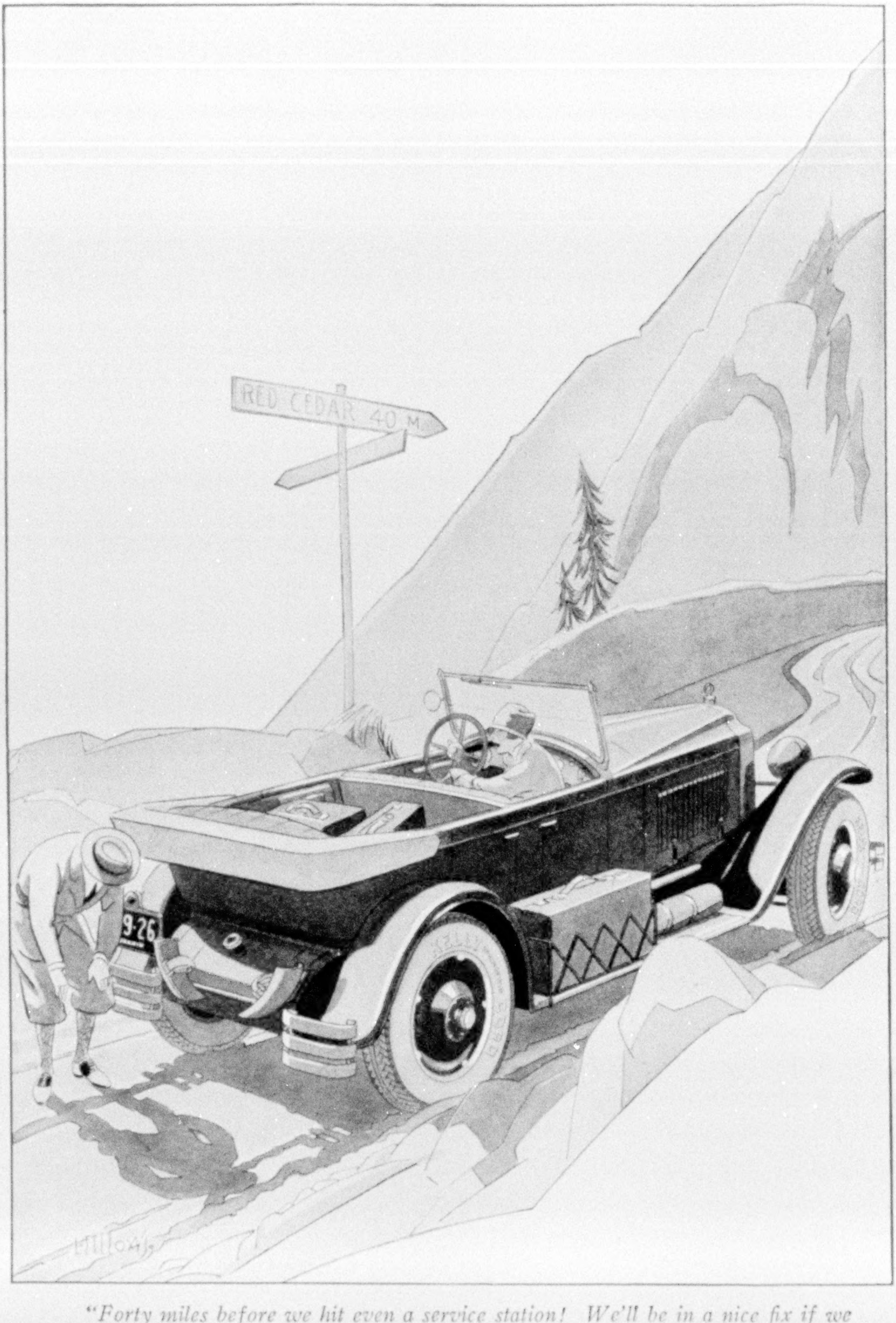
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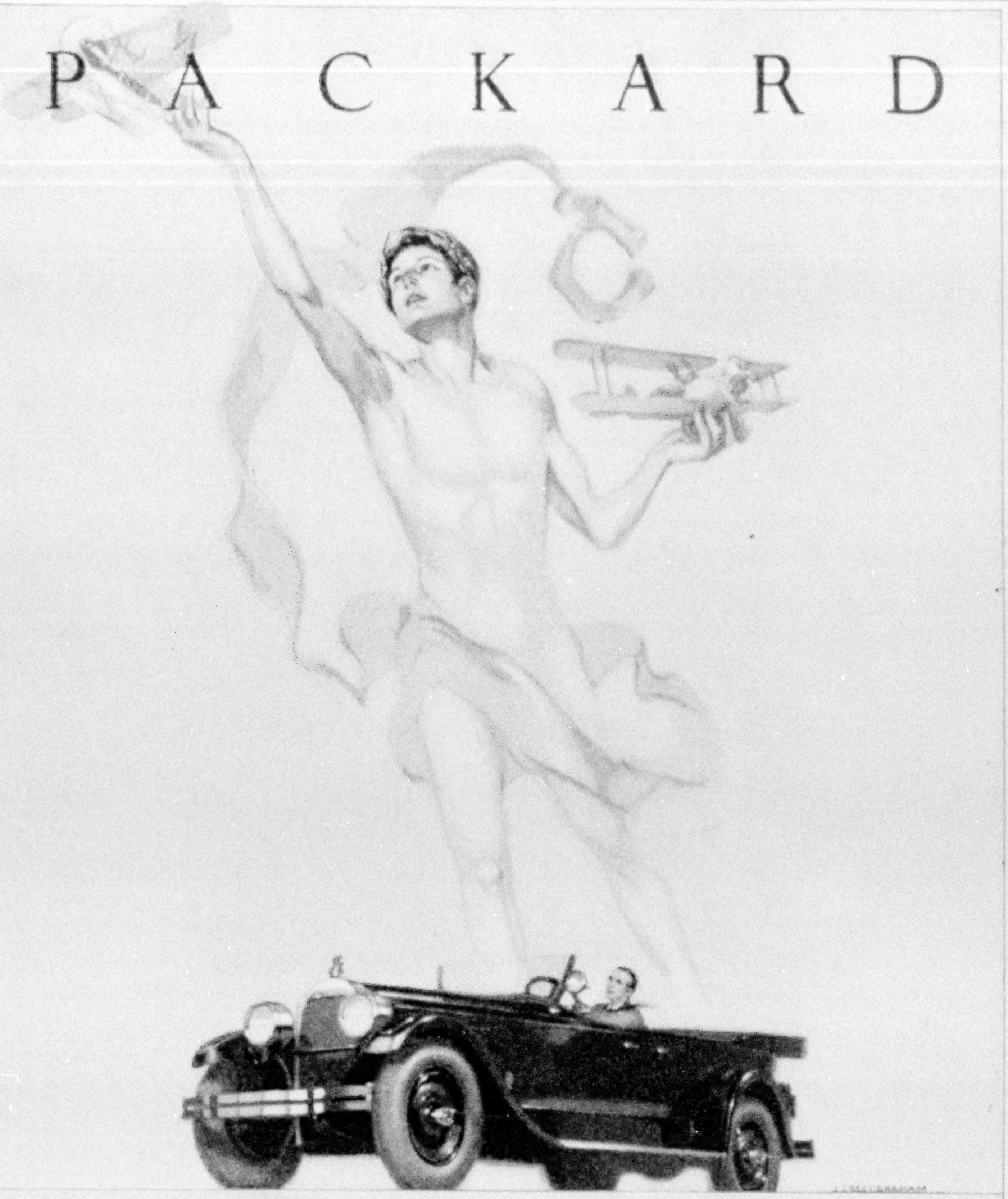
9-26
KELLY

*"Forty miles before we hit even a service station! We'll be in a nice fix if we have a blowout, with no spare!"*

*"I'm not worrying about blowouts; we've got Kelly-Springfields on all around. It's the gas I'm thinking about."*

# PACKARD



THE Navy and Army together have honored Packard with orders for new aircraft engines totaling nearly four million dollars. The new motors, proven supreme by exacting government tests, are a tribute not only to Packard leadership in power plant engineering but also to the vision and sympathetic cooperation of those men who bear the responsibility of our national defense. ▱ ▱ Packard's motor building supremacy is as available to the private citizen as to the United States government—in the Packard Six and the Packard Eight. *Ask The Man Who Owns One.*

JOHN DAVEY, Father of Tree Surgery, "*Do it right or not at all*"

3000 people gathered in the State Armory at Akron (12 miles from Kent) on March 6, 1926, to participate in a great Banquet and Silver Jubilee Celebration of The Davey Tree Expert Company—all for the purpose of paying a fitting tribute to John Davey, Father of Tree Surgery, who published his first book, "The Tree Doctor," 25 years ago

DAVEY TREE SURGEONS

*Live and work in your vicinity—quickly available, within easy motoring distance—no carfare charged*

# *John Davey's great contribution to America*

John Davey was born in England, June 6, 1846, at a time when there were no public schools. This hardy and humble genius was twenty-one before he knew his A B C's. So he started in as a full grown young man to learn to read by the slow and painful process of self-education. He began with a little copy of the New Testament and a small dictionary, picking out one word at a time. Later he acquired a grammar so that he might put the words together properly, meanwhile studying horticulture and landscape gardening during a full apprenticeship at Torquay, England.

Then he heard the call of America, this great land of freedom and opportunity; and, like millions of other sturdy sons of Europe, he came here to work out his destiny. He pursued his education still further, working by day and studying by night, until he acquired an education that would do credit to the majority of college graduates.

Perhaps one of the most striking things about him was the fact that he became one of the finest Americans. He learned every word of our Constitution. He learned every word of every verse of America and the Star Spangled Banner; and, until old age laid its heavy hand upon him, he could sing those songs with a zeal that was good to see.

He became a full citizen at the first opportunity under our law, and to him it was a sacred day when he raised his right hand and forswore allegiance to the British crown and swore allegiance to the Constitution and the flag of America. And always, during his fifty years of life in his adopted country whenever he passed by Old Glory, he would tip his hat in veneration.

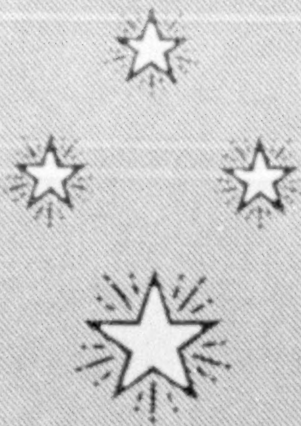
John Davey saw with eyes of understanding the appalling neglect and butchery of America's trees, and he set out to find a way—a systematic, scientific way—to save them, little dreaming that a great business would be developed on the science that his love and genius created. And thus came into being the wonderful profession of Tree Surgery.

His first book, The Tree Doctor, was published in 1901, and then began the gradual development of The Davey Tree Expert Company, incorporated in 1909, doing a business of nearly $2,000,000 in 1925, and now having in the field nearly 700 master Tree Surgeons, all carefully selected, thoroughly trained, properly disciplined, and regularly supervised, and giving superior service to the tree owners of America. For twenty years the business of this institution has been managed by his son, Martin L. Davey, whose highest aim has been to perpetuate the ideals and philosophy of his pioneer father.

John Davey, though not now living, still lives in the spirit and purpose of the magnificent service that he rendered his adopted country—he taught the American people to think in terms of the living tree. Greater even than his creation of the invaluable science of Tree Surgery is his contribution as the apostle of the tree as a living thing.

THE DAVEY TREE EXPERT CO., INC., 403 CITY BANK BLDG., KENT, OHIO

*Branch offices with telephones: New York, 501 Fifth Ave., phone: Murray Hill 1629; Albany, City Savings Bank Bldg.; Boston, Massachusetts Trust Bldg.; Philadelphia, Land Title Bldg.; Baltimore, American Bldg.; Washington, Investment Bldg.; Pittsburgh, 331 Fourth Ave.; Buffalo, 110 Franklin St.; Cleveland, Hippodrome Bldg.; Detroit, General Motors Bldg.; Cincinnati, Mercantile Library Bldg.; Indianapolis, Fletcher Savings and Trust Bldg.; Chicago, Westminster Bldg.; St. Louis, Arcade Bldg.; Kansas City, Scarritt Bldg.; Minneapolis, Andrus Bldg.; Montreal, Insurance Exchange Bldg.*



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# Now she understands

AS SHE was completing her morning toilet, she could not repress a little yawn. Thus, in the mirror before her, she saw reflected the gold fillings in her back teeth. The sight made her thoughtful.

White, strong and spotless all those teeth had been ten years ago. She fondly hoped to keep them so always. But, in spite of all her care, year by year new cavities had formed; and she had lost two molars.

"At this rate, what will they look like ten years hence?" she asked herself candidly. She decided to see her dentist again.

He found two new cavities and considerable tartar.

"But must this go on forever?" she insisted. "Is decay and loss of teeth inevitable?"

"Place this behind your teeth," he said, handing her a little mirror. "Look in there, closely. You don't clean those hidden places. Nobody does! Brush and paste don't get in there. So decay goes on unchecked, and tartar accumulates."

"But I am doing all I can," she said, "clean them three times a day!"

"Did I not tell you about a preparation lately perfected by scientists at the Mellon Institute, University of Pittsburgh?" he said. "It helps you clean not only the visible surfaces, but all the hard-to-reach places. It's a liquid—that's important. More important still, it is an effective solvent for mucin film, sought by experts for 30 years. It's the best thing I know of. Keeps away tartar, too."

That's how she came to use Mu-Sol-Dent.

*She thought her teeth were clean. Then, with a little mirror, she made an unpleasant discovery. Try it yourself!*

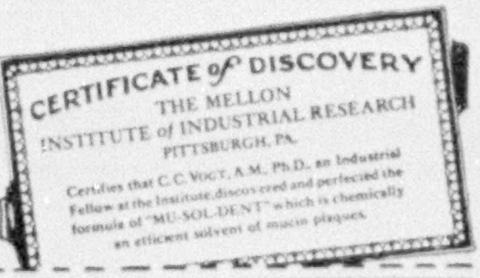
She still goes to her dentist now and then, but the story now is different.

"No new cavities," he says, "and very little tartar. People don't realize that tartar is a frequent cause of pyorrhea and loss of teeth."

"Mu-Sol-Dent is wonderful," she says. "So pleasant to use; makes my mouth feel so sweet and clean. I have discarded toothpastes and powders entirely. And I imagine my teeth look brighter and cleaner than they ever did before. I wouldn't for anything go back to the messy old way of cleaning my teeth!"

*Mu-Sol-Dent is for sale at leading drug stores everywhere*

***Get it from your druggist or send 10 cents for sample bottle.***



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DOUGLAS FIR is the natural choice of the home builder.

For years a widely used commercial wood, today it adapts itself to a greater variety of uses than any other softwood.

Developments in manufacturing methods and kiln drying have further extended its usefulness.

Important have been the contributions to that development in Long-Bell manufacturing plants at Longview, Wash., where continued study is being made to improve methods of production.

### *Its Many Uses*

The strength, durability and beauty of grain of Douglas Fir adapt it to use throughout construction.

From the sturdiest framing to the fine texture and beauty of interior trim, Douglas Fir answers every purpose adequately.

The kiln drying of Long-Bell Douglas Fir lumber is no small factor in making it best fit for these uses.

Today, Douglas Fir is being used as framing, rafters, joists, sills, flooring, siding, frames and interior trim.

### *These Important Advantages*

It is these advantages, and more, which Long-Bell methods of manufacture offer buyers of Douglas Fir lumber:

Straight dimension makes straight walls and level floors. Long-Bell trade-marked Douglas Fir dimension stays straight, and flooring, ceiling and siding do not have to be forced to make tight joints.

An average of 86 per cent of the pieces of Long-Bell Douglas Fir dimension and common boards are *all heart*, and more than 78 per cent of the entire production is *all heart*.

Long-Bell forests contain a high percentage of large yellow Douglas Fir, which produces the softest fir finish of great *heart* content and beautiful grain effects.

All Long-Bell trade-marked Douglas Fir lumber is trade-marked to identify it readily to the buyer.

### *California White Pine Lumber*

California White Pine has many advantageous uses in construction and in industrial consumption. Long-Bell trade-marked California White Pine lumber and shop lumber are produced at Weed, Calif., from an excellent stand of timber grown at high altitude.

*Shippers:* Wood today is the desirable material for boxes and containers . . . for safe delivery at destination.

### *Long-Bell Oak Flooring*

Long-Bell trade-marked oak flooring finds ready place in the laying of *serviceable* floors. It is most economical to lay and finish, because of its excellence of manufacture. It makes a beautiful, lasting floor.

The trade-mark on all Long-Bell products is more than a name. It means more than fifty years of experience as lumbermen, and is found only on lumber products that give maximum value to the builder.

*Ask your retail lumber dealer*

The Long-Bell Lumber Company
R. A. Long Bldg. Kansas City, Mo.
Lumbermen Since 1875

THE OLDEST HOMES IN AMERICA ARE BUILT OF WOOD

### When Home-Building Time Comes

BUILD for the tomorrows . . . the sort of home that preserves its growing wealth of associations through many years. Look well to the materials and the workmanship . . . use the skill and experience of one of those master builders in your community who insists on good workmanship . . . *and know the lumber you buy.*

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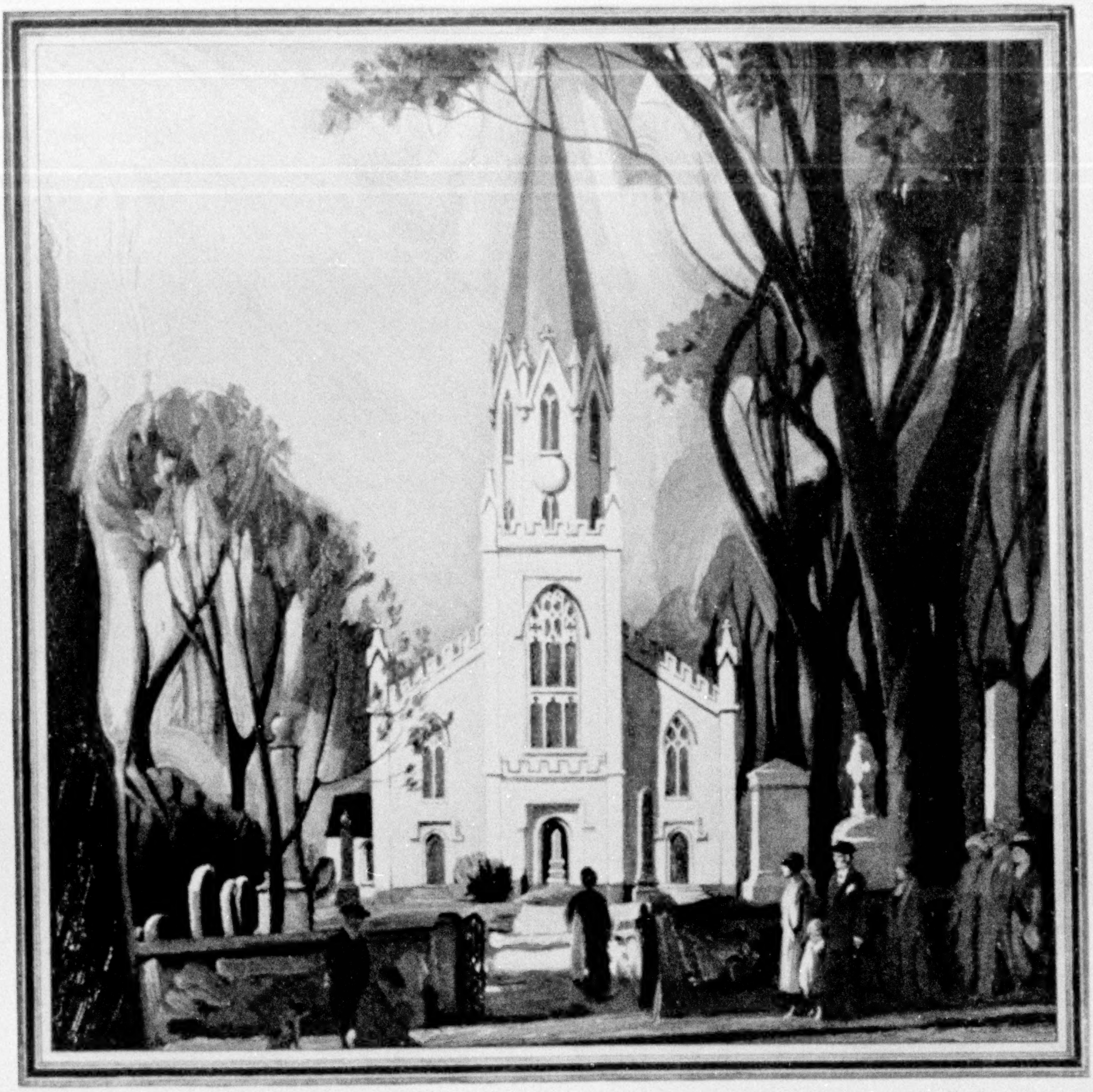
❧

KNOW THE LUMBER YOU BUY



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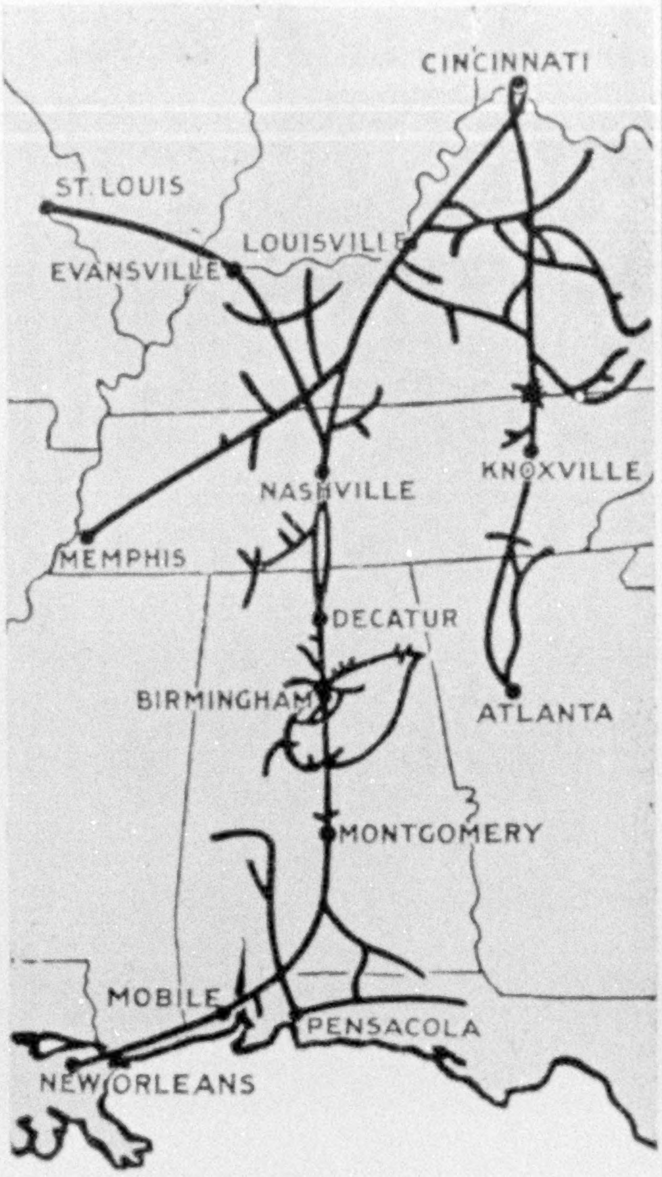

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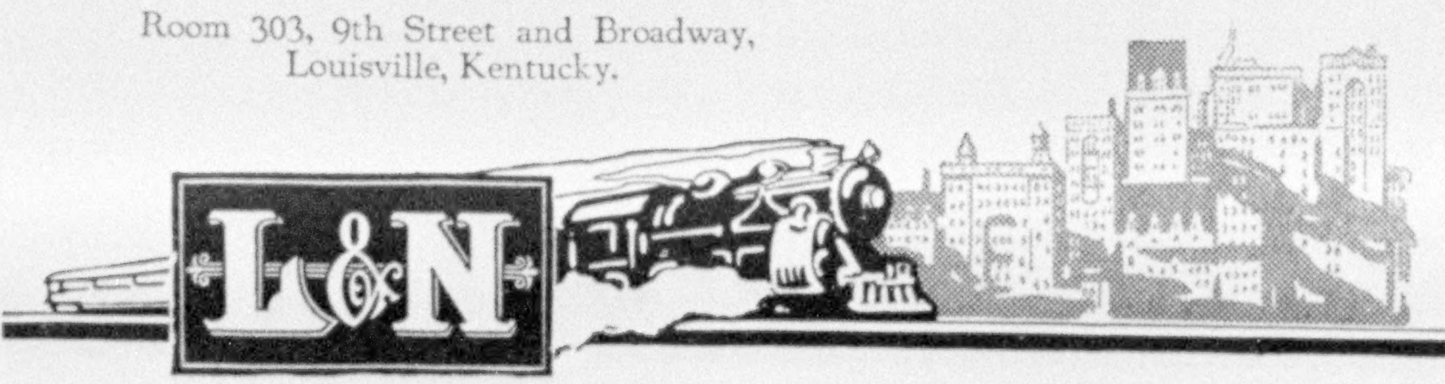

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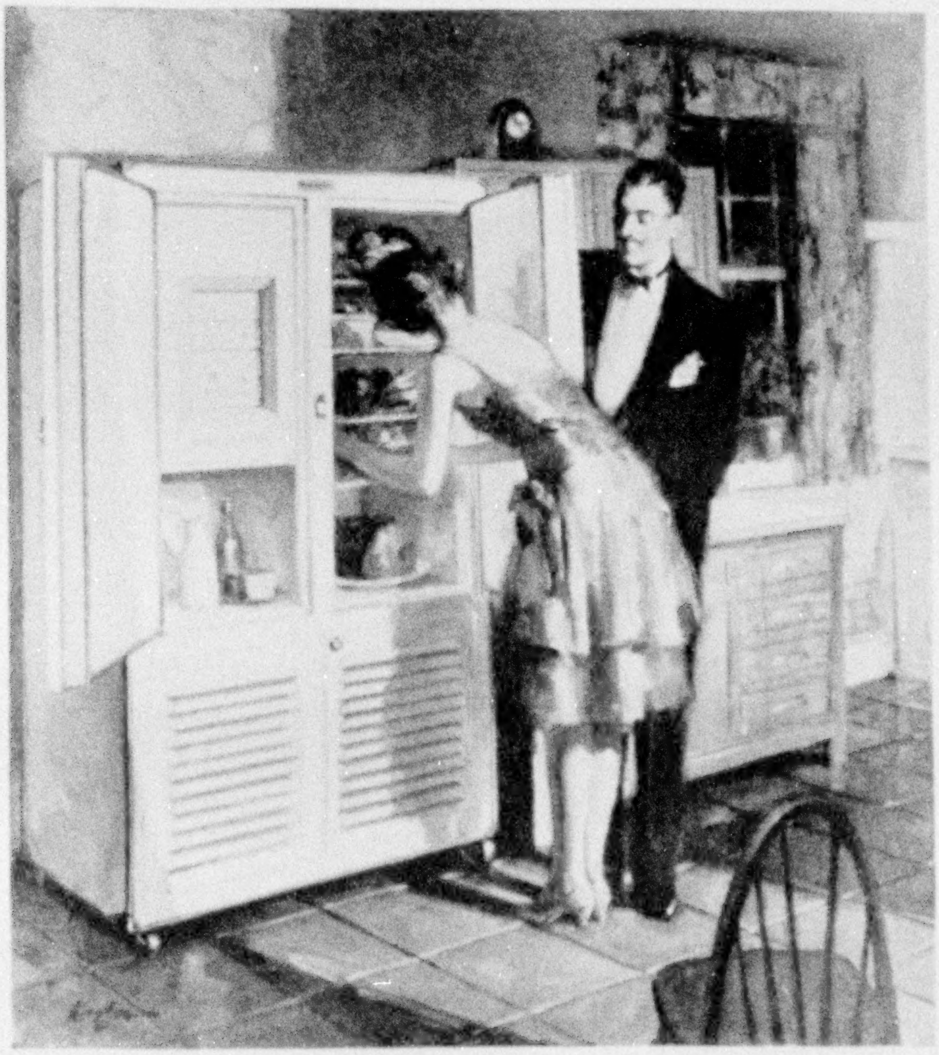

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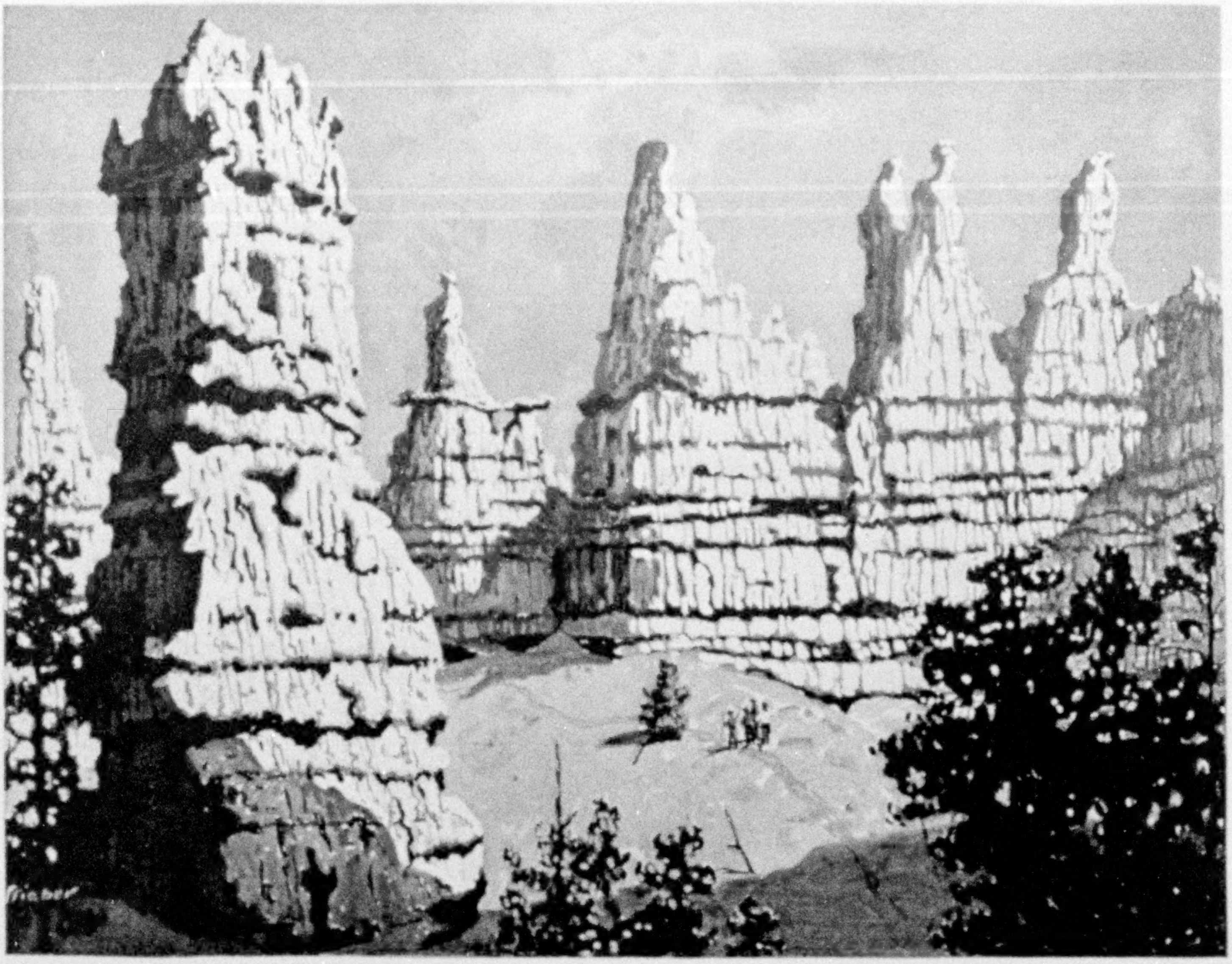

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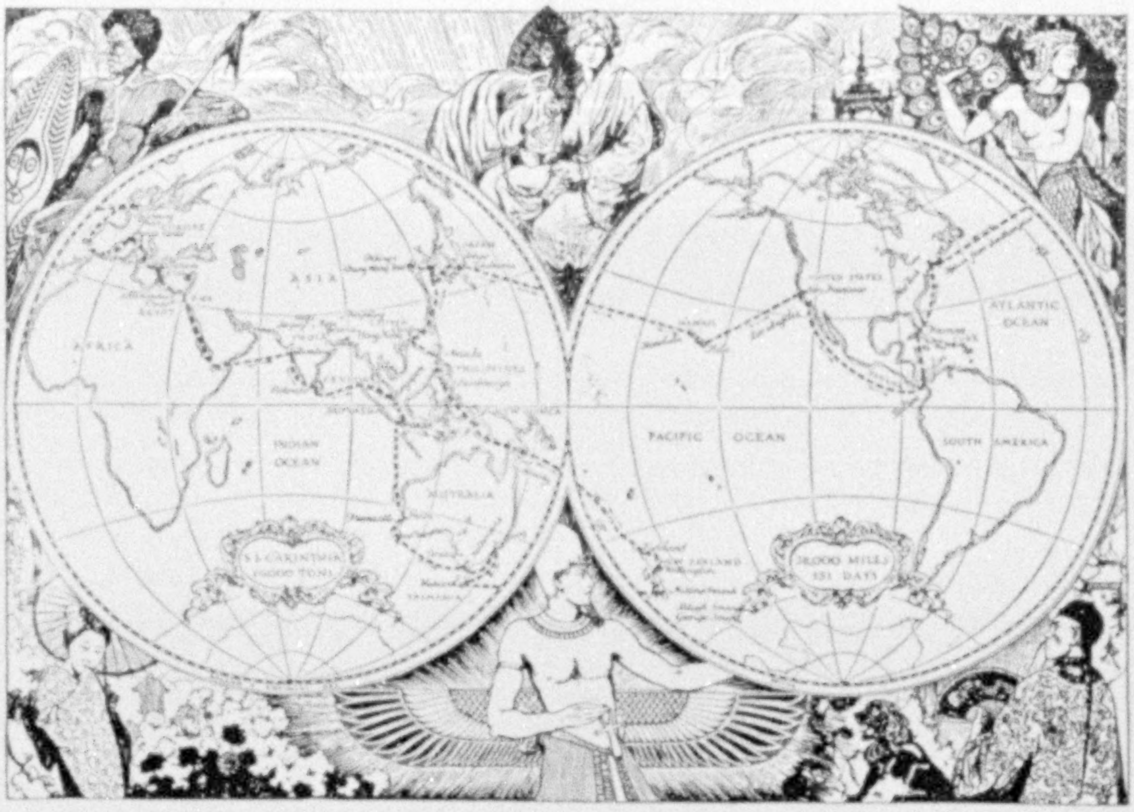
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# hawaii

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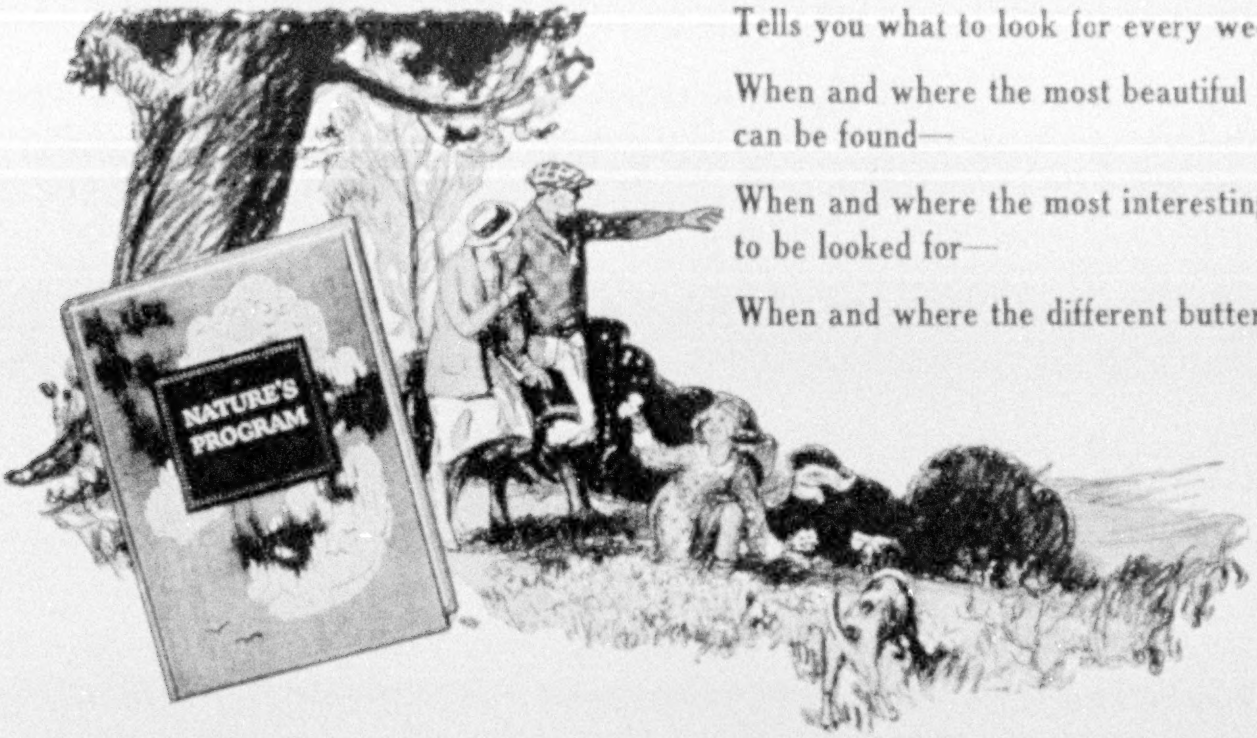

Tells you what to look for every week.

When and where the most beautiful wild flowers can be found—

When and where the most interesting of birds are to be looked for—

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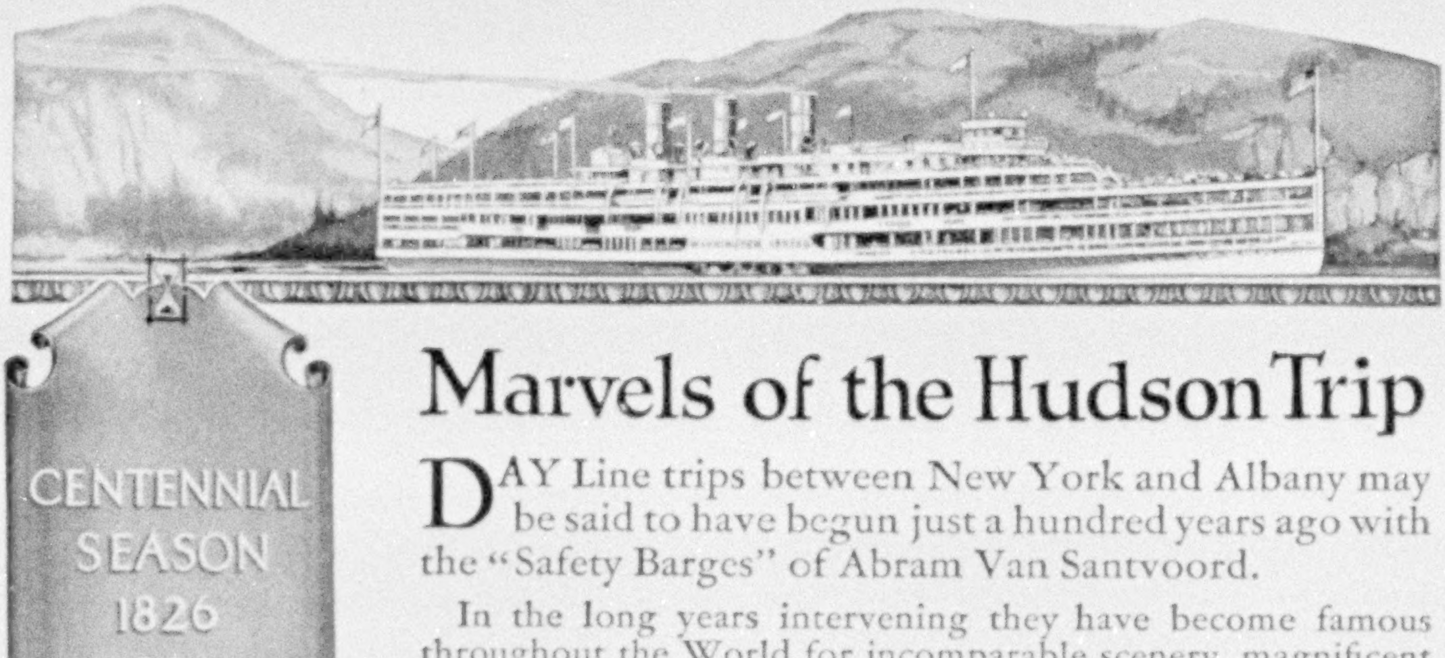

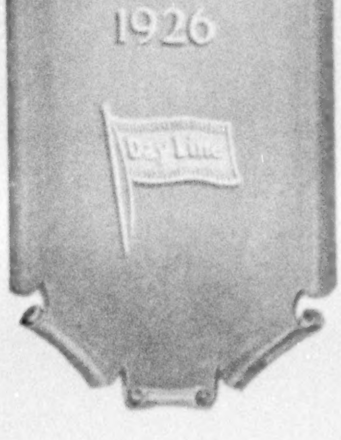

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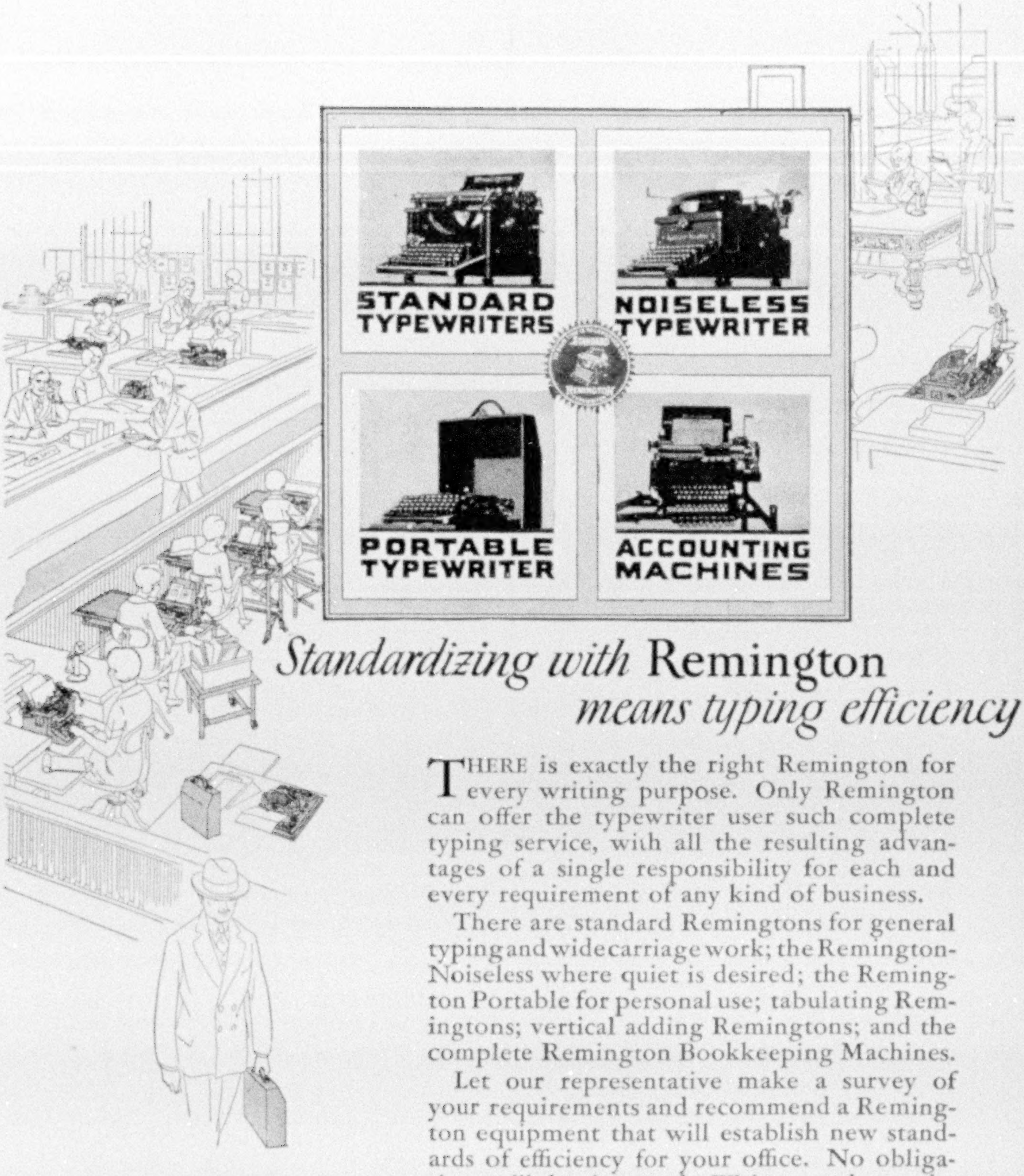

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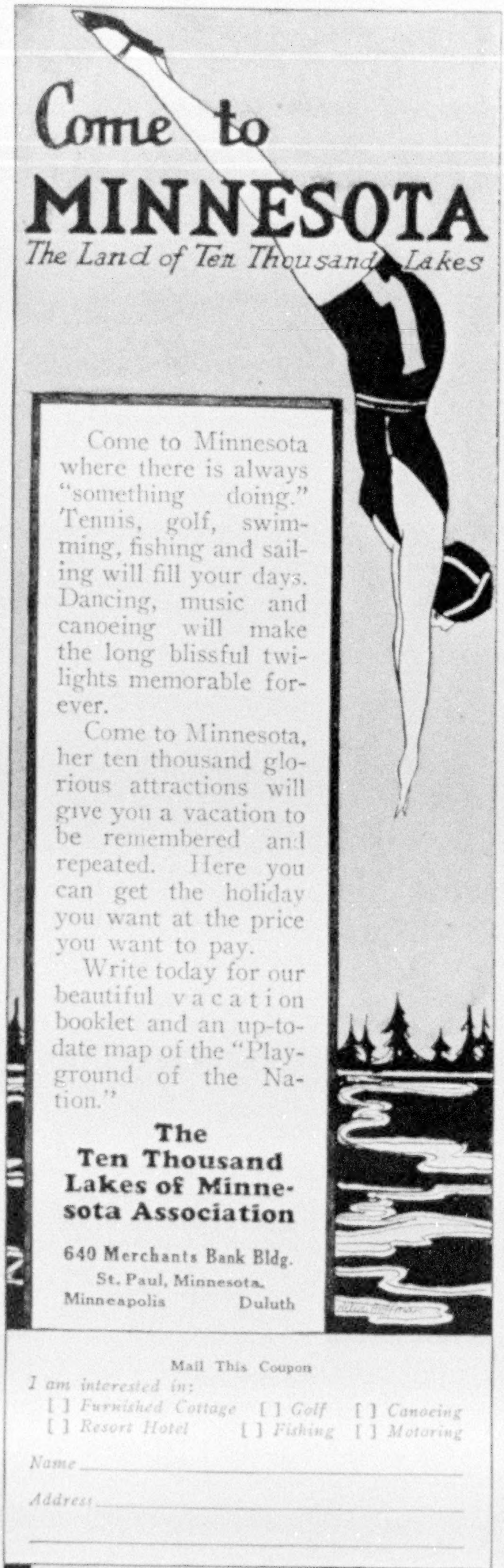

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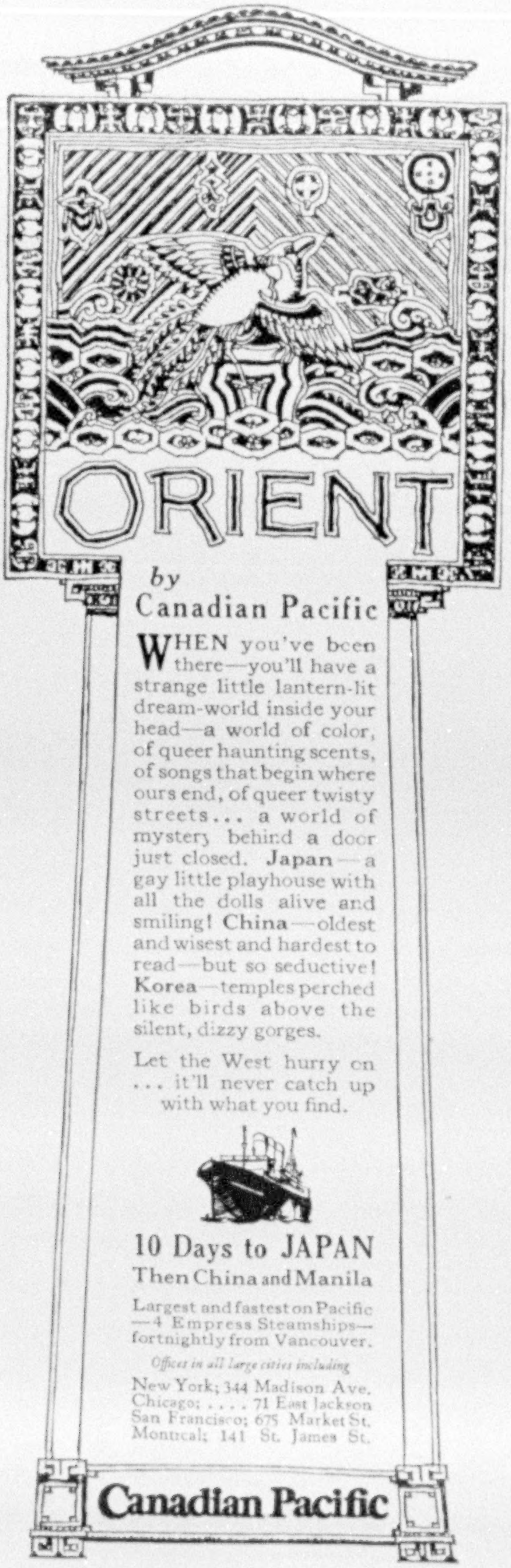

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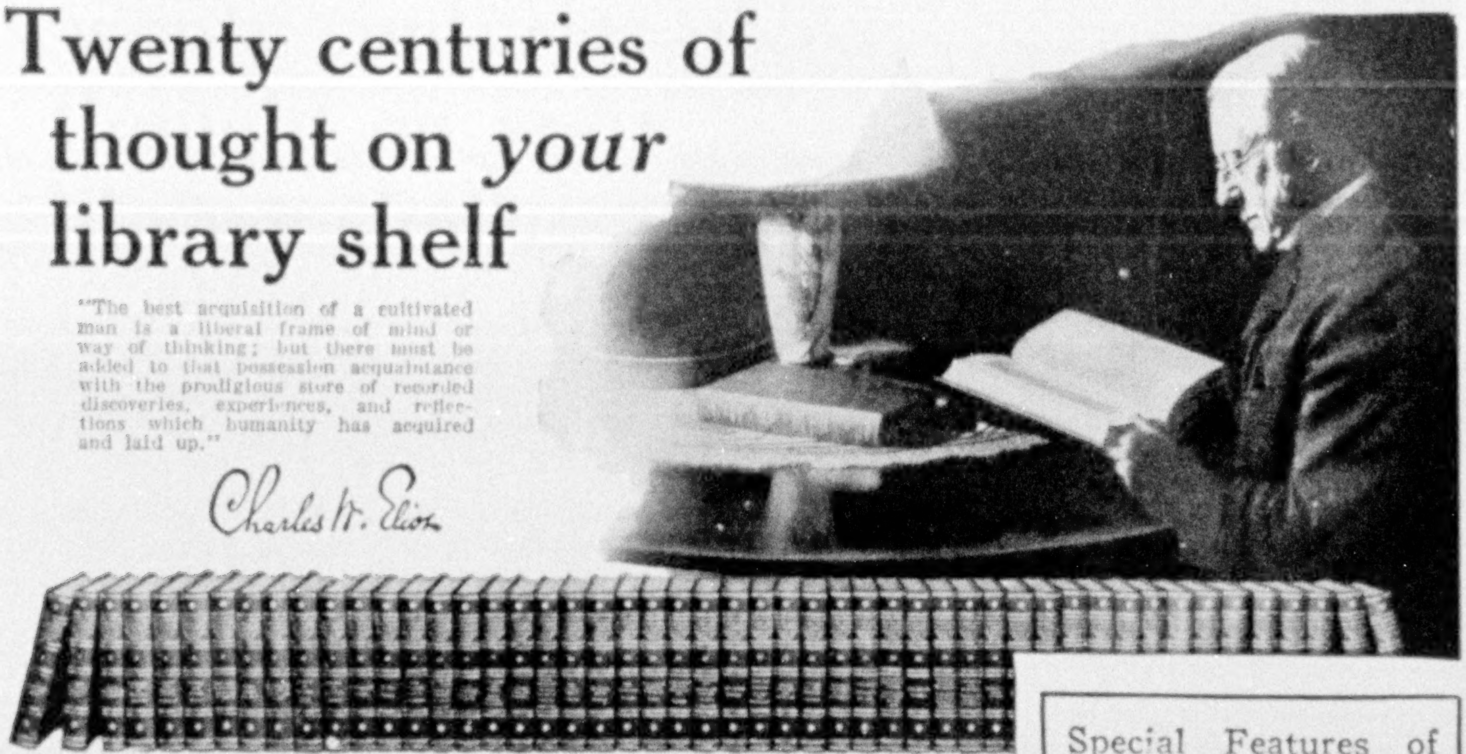

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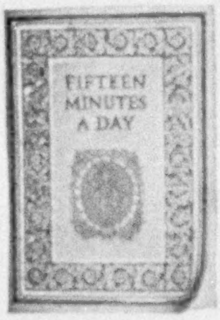

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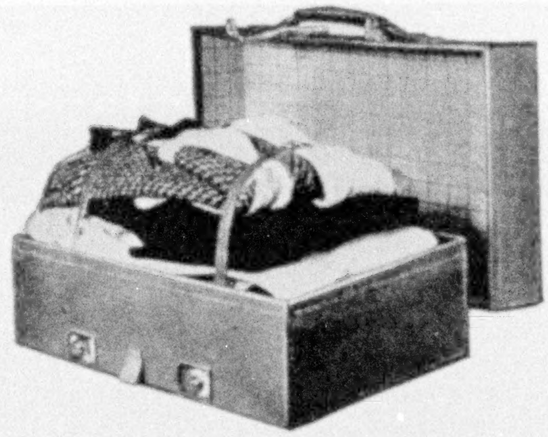

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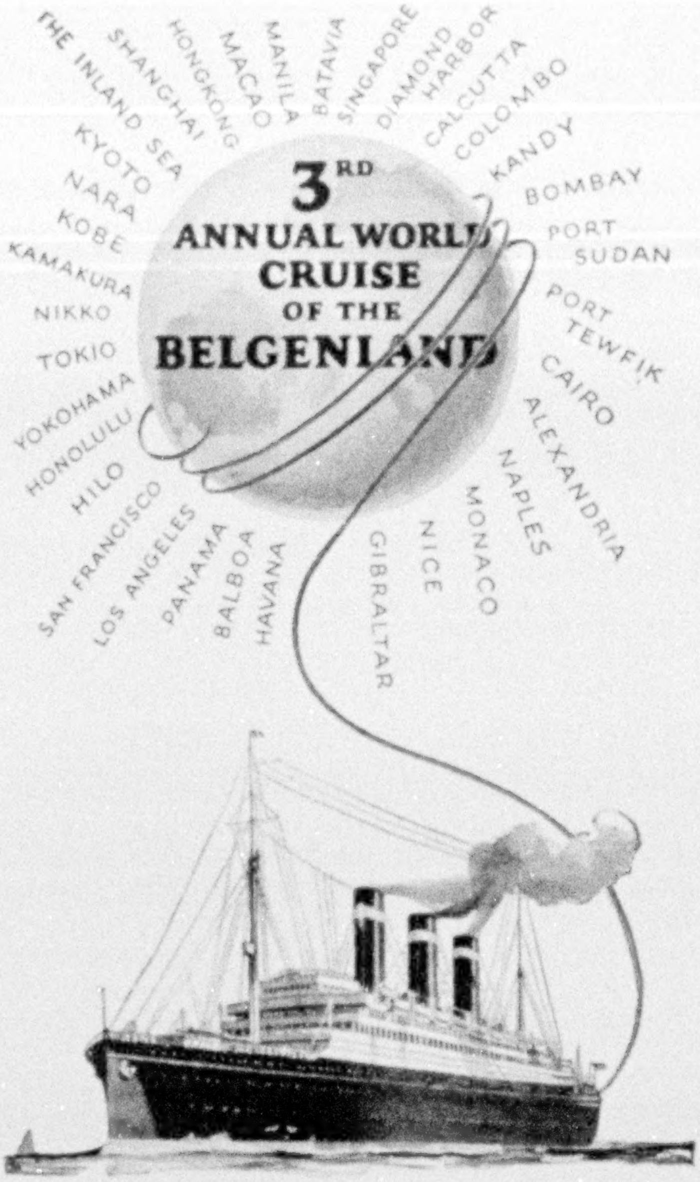
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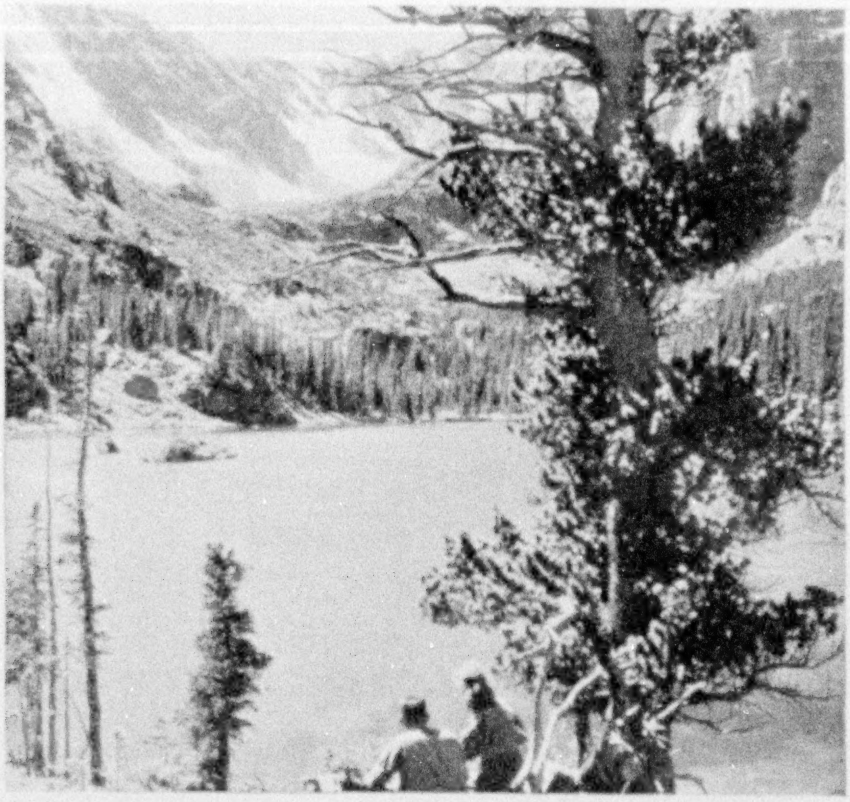

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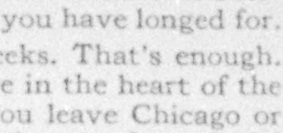

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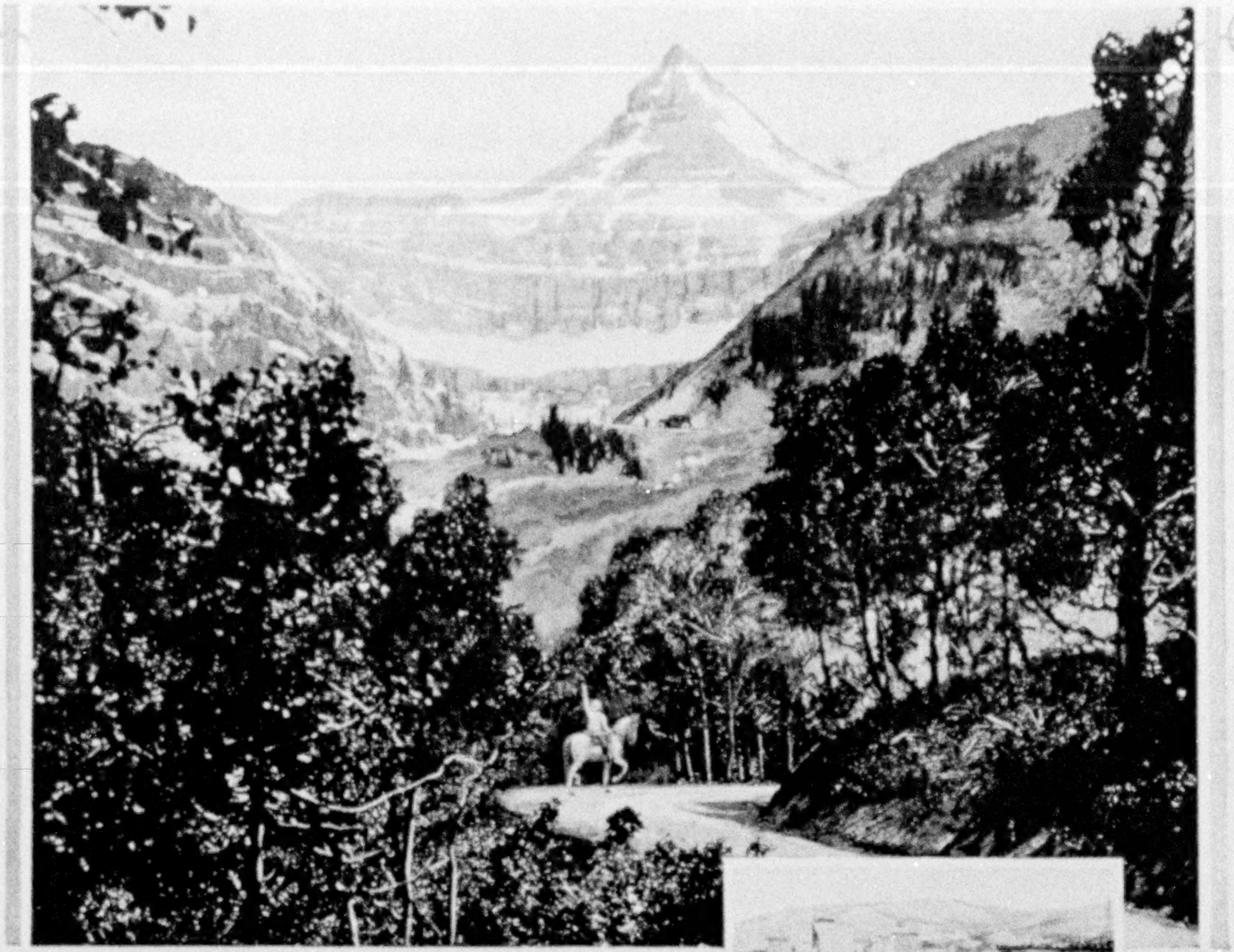

*Alpine Scenic Highway, two hours from City*

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*Beautiful ~ Interesting*

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"Center of Scenic America"

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*Floating like a cork in Great Salt Lake*

*The Famed "Mormon" Temple and Tabernacle*

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Salt Lake City offers new experiences, **different** experiences! Think of majestic mountains at your very doors! Think of a magic dip in the waters of Great Salt Lake, where you **can't sink!**

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Mr. Dodson, President of the American Audubon Association, making friends with a black-capped chickadee at Bird Lodge, Kankakee, Ill.

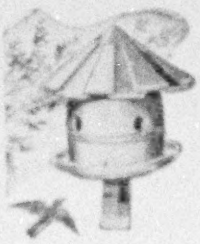
# Happiness Follows Every Little Bird

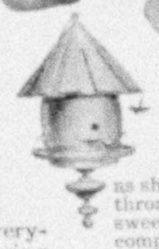
There is something about the intimate confidence and trust of the wild birds that brings joy to the hearts of everyone. Possibly no other living things are so quick to sense the protection and welcome that properly designed houses and shelters afford.

One can watch them with untiring interest as they hop from twig to twig, working and singing the whole day through, ridding your cherished trees, shrubs, flowers and premises of injurious moths, beetles, mites, mosquitoes and other insect pests.

## WHY DODSON HOUSES WIN THE BIRDS

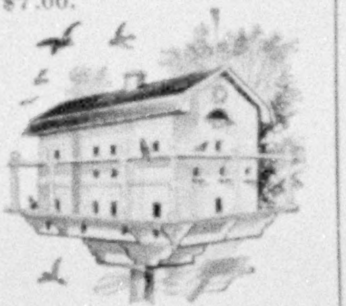
Mr. Dodson has for many years devoted his entire time to lecturing, visiting beautiful estates in the study of wild birds all over America. Many seemingly insignificant details have been discovered and patented by him that are vital in the luring of songbirds to man-made houses. Mr. Dodson is always willing to talk before clubs or associations interested in creating bird sanctuaries, either private or municipal.





### Dodson's Scientific Wren House

as shown above. The Silver-throated Wren is one of our sweetest singers. A four-compartment house satisfies their habit of changing nests for each of their three broods. Beautiful design, made of oak, finished in green, with cypress shingles, copper coping, comes complete with rust-proof snap on hanger. Size, 28 in. high by 18 in. in diameter. **Price, $7.00.**



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48 rooms for the beautiful Martins, who colonize. Scientific porch, pure white, green trim. Cypress, copper roof, including 22-foot easy raising pole. House, 26x26x37 inches. **Price, $60.00. Others as low as $18.00.**

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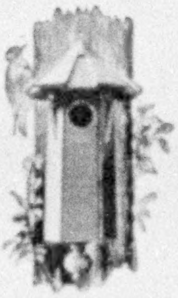
The happiest and most beloved songsters. Our scientific houses satisfy these most exacting birds. Made of oak, finished in green. Size 21 in. high by 16 in. in diameter, with 18-ft. easy raising pole. Price, **$14.00.**



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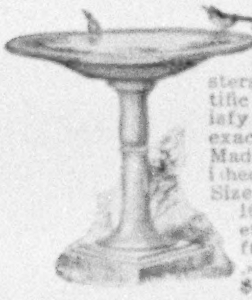
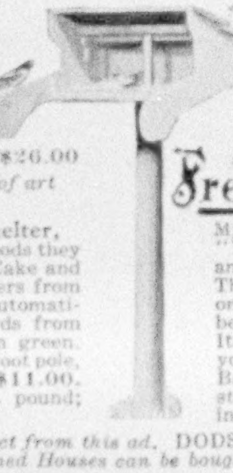


### BIRD BATH

This handsome stoneware bath is an ornament for any garden, being very graceful and substantial. The birds bathe freely in it, as they do not fear the cats. Complete with 32-in. stand, only **$26.00**

*Write for our big catalog of art stoneware furniture.*



### Automatic Feeding Shelter,

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My fascinating book, "Your Bird Friends and How to Win Them," sent to anyone who loves our beautiful songbirds. It is full of things you should know. Based on 40 years' study of this most interesting subject.

Ask about Dodson's Guaranteed Sparrow Trap.

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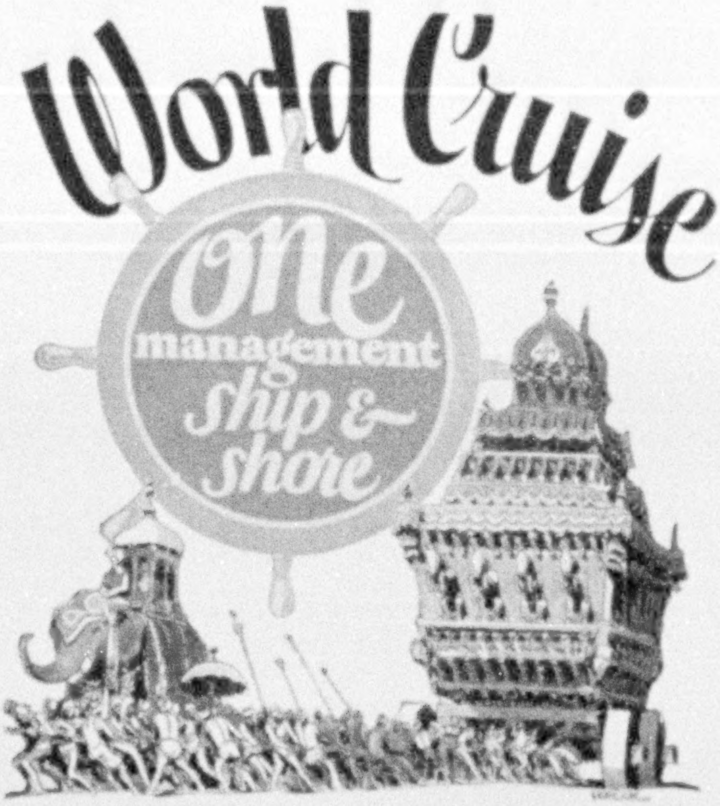

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# Parker Duofold

WITH THE 25-YEAR POINT

## *The same, save for color, as the Black-tipped Lacquer-red*

RICH Black and Gold like this, or Black-tipped Lacquer-red—either way a fresh brand of Confidence comes to the hand that clasps a Parker Duofold.

For here is a pen with a swing so balanced, a feed so sure, a point so super-smooth, that it leaves your mind unfettered to focus on your subject.

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A point guaranteed if not misused for 25 years' wear. A point that yields to any writing style, yet retains its original shape regardless.

Hand-size Grip, Over-size Ink Capacity—stop at the nearest pen counter and choose your point—Extra-Fine, Fine, Medium, Broad, Stub or Oblique.

While there—see its team-mate—the Parker Duofold Pencil. A perfect match—Hand-size Grip and all.

*Parker Duofold Pencils to match the Pens:*
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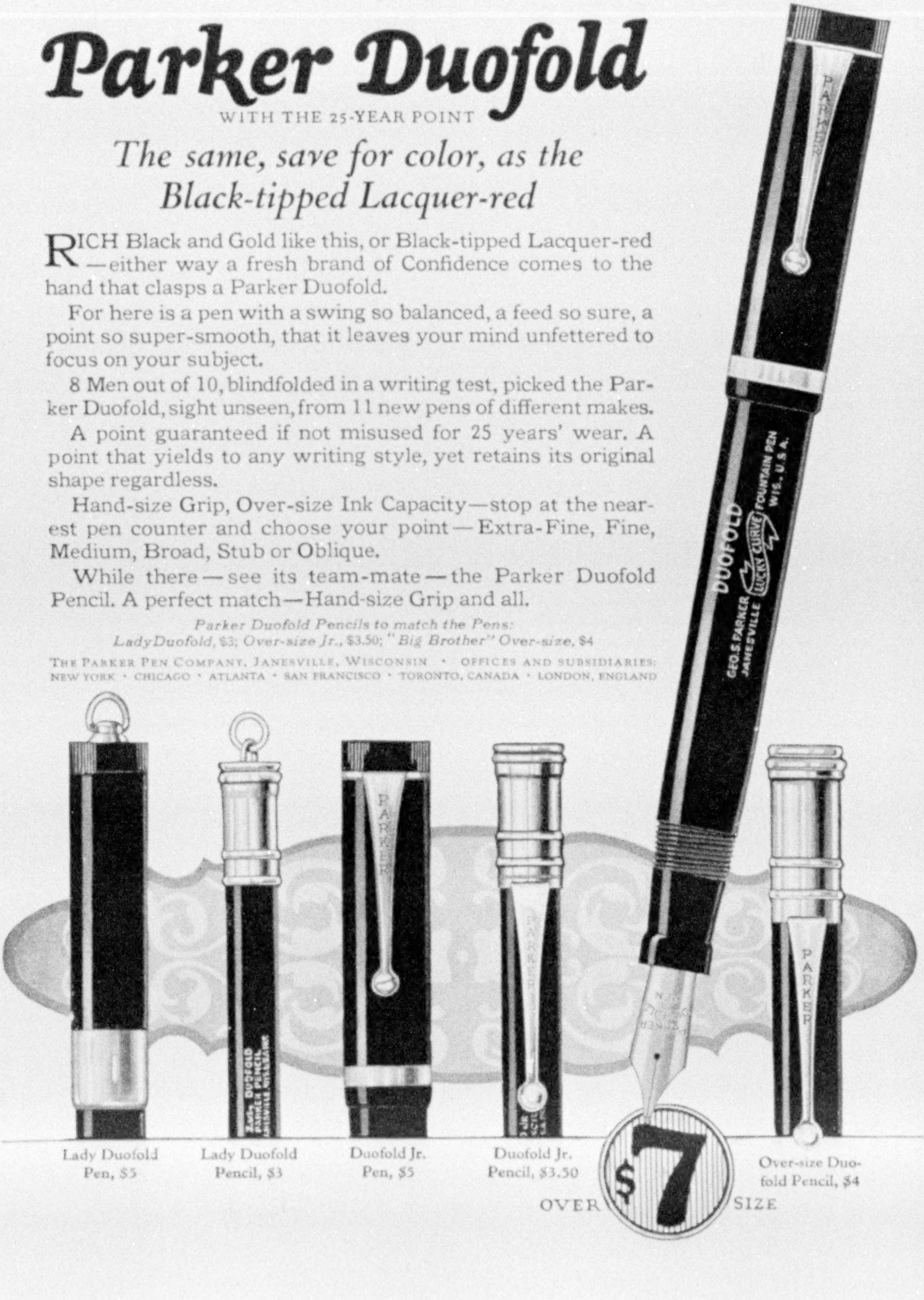
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Your present method may suit you well. But still there may be a better one. This test may mean much to you in comfort. Send the coupon before you forget.

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Simply insert your name and address and mail to Dept. B-1196, The Palmolive Company (Del. Corp.), 3702 Iron St., Chicago, Ill.

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Sooner or later you will discover the appeal of The Charmed Land of The Pacific Northwest. Why not do so this summer?

Surrounding that remarkable one-generation city, Seattle, you find, easily and comfortably accessible, Mount Rainier, Puget Sound, Mount Baker National Forest, Lake Crescent and Lake Chelan, Hood Canal, San Juan Archipelago, the matchless Olympic Peninsula. Here, in a ten-day visit, you can revel in mountain-climbing, summer snow sports, glacier-exploring surf bathing, golfing, fishing, or cruising among the lovely islands of a great inland sea. Seattle is America's coolest summer city.

Special low round-trip fares to September 15. Write today for free, illustrated vacation booklet: "Seattle and The Charmed Land." Room 104, Chamber of Commerce, Seattle, Washington.

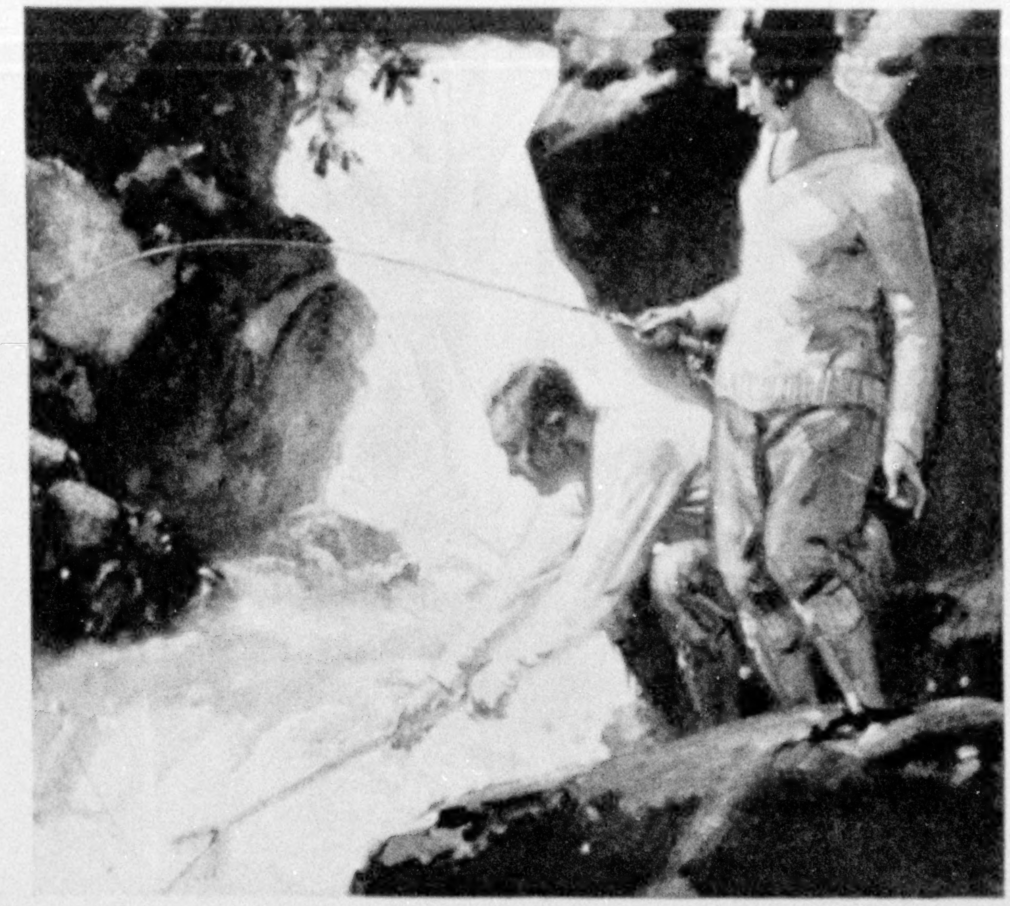
## PACIFIC COAST EMPIRE TOUR

*And then, See "All the Pacific Coast." Come out over one of the four northern transcontinental lines. See Seattle, Spokane, Portland, Tacoma; then, by rail or water, to Oakland, San Francisco, Los Angeles and San Diego. Or, if you prefer, travel the other way and come northward, by train or steamer. See "All the West" in 1926!*

**Seattle**

Metropolis of the Pacific Northwest

# FIGHTING FISH PATROL THE WATERS OF ADVENTURE LAND



# Glacier National Park

## *on the* GREAT NORTHERN

*Open June 15 to Sept. 15*

COLD all summer are the surface waters of the lakes and streams of Glacier National Park. Voracious trout, frequently of giant size, rise to your bait in the still as well as the rapid waters. Come out and match your skill against this wily foe.

Hike, ride horseback, climb, explore. Tour in motor coaches and motor launches. Sleep in the open, in quaint log chalets, or in the completely equipped, modern hotels. Generous portions of excellent food will curb your eager appetite. Go as you please tours or Burlington Escorted Tours at fixed costs with all details arranged—Alaskan Tours.

But do not postpone your arrangements to visit Glacier National Park. Mail the coupon now. Low Round Trip Summer Fares to the Pacific Northwest—Spokane, Seattle, Portland, Tacoma and Vancouver—include liberal stop-off at Glacier National Park going or returning. Inquire today.

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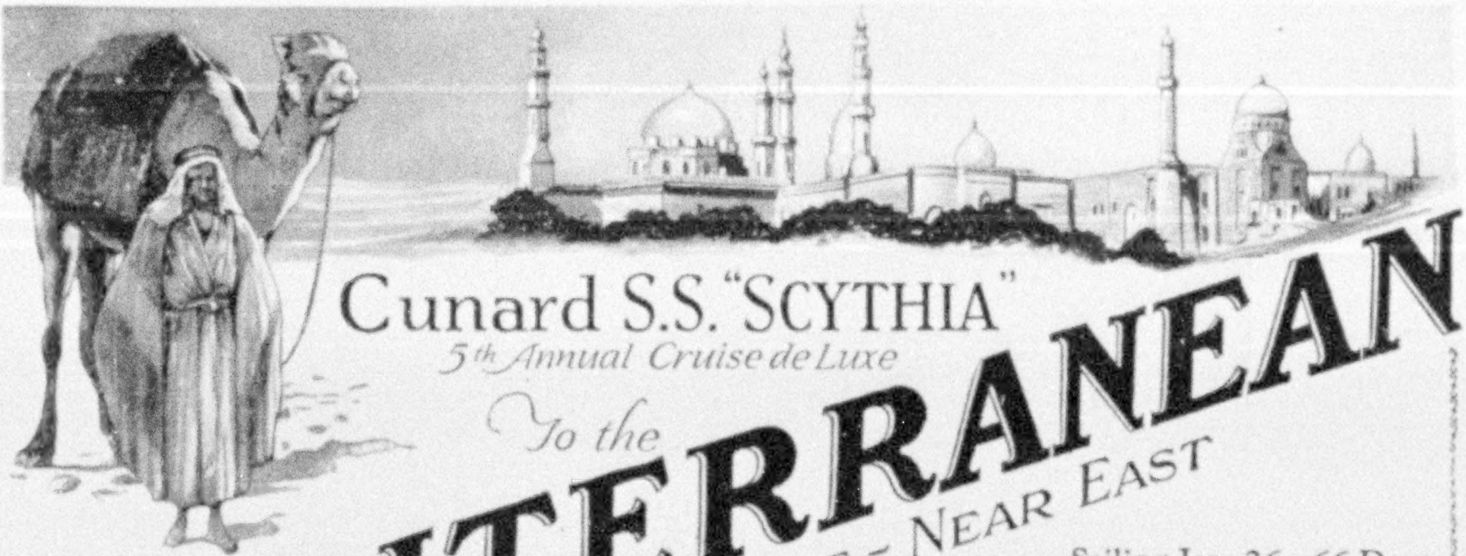
GREAT NORTHERN

*a dependable railway*



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This Sport Touring, designed by Brunn, gives a new conception of open car beauty. It has many unusual refinements and conveniences.

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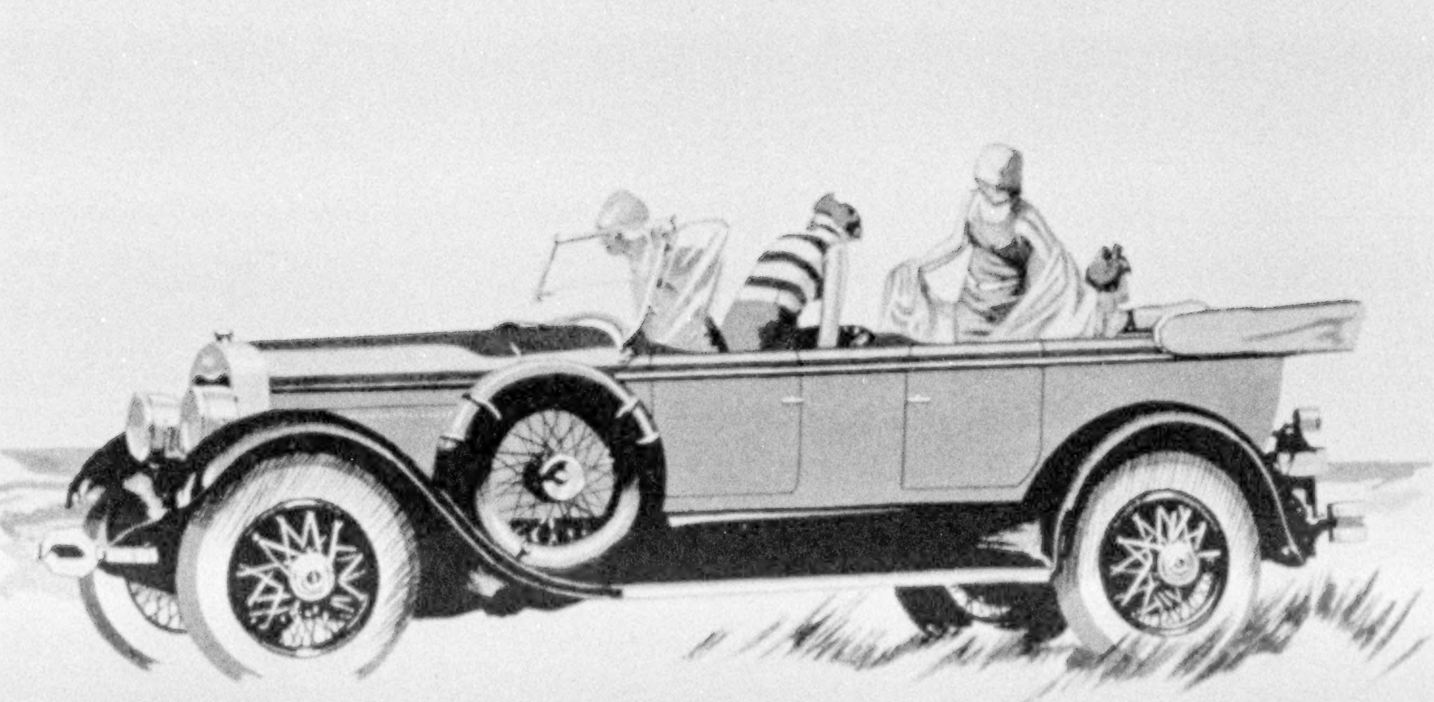

"The Sunshine Belt to the Orient"

*Strange people, colorful surroundings, the quaint customs of Old China.*

## A Millionaire's Trip at $11.37 per day

Meals, berths and transportation included. Round the World with calls at 22 ports in 14 countries. Luxurious first cabin accommodations aboard a palatial President Liner. Optional stopovers. Write for additional details.

A TRIP Round the World at a cost that is little if any more than you spend at home.

You visit Honolulu, Japan, China, Manila, Malaya, Ceylon, India, Egypt, Italy, France, Boston, New York, Havana, Panama Canal, Los Angeles and San Francisco.

At any port you may stopover for two weeks or longer. Or you may make the complete circuit on one liner—110 glorious days—with several hours at each port for sightseeing.

"I enjoyed a wonderful trip on the Dollar Liner 'President Harrison.' Best steamer and service that I have ever seen," wrote Roy Carruthers, managing-director of the Book-Cadillac Hotel, Detroit.

So also have been the comments of thousands of travelers aboard these ships. Great liners, broad of beam, steady and comfortable. Every room is outside. You have a real bed. The appointments are luxurious.

The cuisine has won the praise of the most critical world travelers. The service is personal and courteous.

One of these President Liners sails every Saturday from San Francisco (every two weeks from Boston and New York).

$11.37 per day per person provides fine accommodations plus a life-time travel experience.

Go Now. Reserve your accommodations. Let us help you plan your itinerary and shore trips, aid in any possible way. Call on any ticket or tourist agent. Communicate with any office listed below. But also send the coupon for literature covering this finest of all trips.

**Dollar Steamship Line**

604 Fifth Avenue
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Mr. Hugh Mackenzie, G.P.A.
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Please send me illustrated booklet and other literature about your Round the World service.

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***Deagan Tower Chimes***

*Played by Organist from Electric Keyboard*

***The Memorial Sublime***

Through no other means can you confer on your church and community a greater beneficence. Beautiful memorial booklet on request.

*Standard Sets $6000 and up*

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**Wilmington**

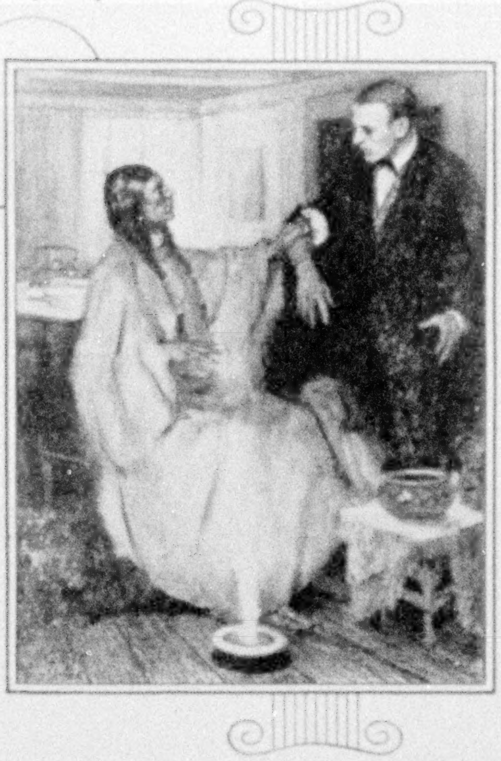
**North Carolina**

*"Playground of the South"*

Thousands are now enjoying the sports in the South's finest climate at this center of recreation. Summer temperature, 78°. Every sporting and amusement facility. Include Wilmington in your vacation plans. Write for beautiful, illustrated, descriptive booklet. Address Desk 10.

CHAMBER OF COMMERCE
Wilmington North Carolina

# What about Cancer?



THE SHAM MYSTIC

Scattered all over the country are cruel imposters who claim to have the ability to cure cancer. The old Indian woman who pretends to heal by occult rites is less dangerous than the crooked institutions and individual practitioners who advertise that their mysterious "treatments" will cure this dread disease.

THERE is good news about cancer. In many instances it can be prevented and if treated in its early stages it can be eradicated. Sometimes it can be successfully removed, even when it has progressed beyond the early stages. It does not break out in another place when the removal is complete.

A cancer in the body is like a weed in a garden. It begins in one spot as a small growth. There is only one course to follow with cancer as there is with a weed—get rid of it immediately and *entirely*.

Do not imagine that because someone in your family died of cancer, you are doomed. In some families the tendency toward cancer seems to be hereditary, but the disease itself is not.

Cancer is not contagious. To avoid sufferers is as stupid as it is cruel. There is not a single authenticated record of any person having contracted the disease through association with a patient.

Be on the watch for the first signs of cancer. Do not neglect any strange growth. Be suspicious of all abnormal lumps or swellings or sores that refuse to heal. Look out for moles, old scars, birthmarks or warts that change in shape, appearance or size. Jagged or broken teeth or ill-fitting dental plates may cause cancer, also continued irritation of any part of the body.

The failure of internal organs to function normally, or an unusual discharge from any part of the body should at once receive thorough and skilful attention. Make certain whether or not the cause is cancer.

Remember this: Once it has begun to develop, Nature alone is helpless to stop the growth of cancer. But it may be removed by surgery or destroyed by X-rays or radium. Do not wait, thinking that the trouble will clear up. Do not wait for pain. In the early stages there is no pain. Time is a matter of life and death with cancer.

The greatest scientists of the world, though they have searched for years and are still searching, have not found a serum to prevent cancer or drugs to cure it. The great victories have come from surgery, X-rays or radium.

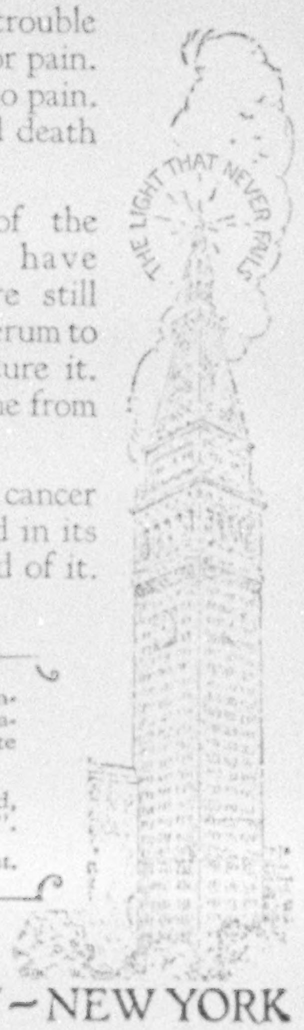
Spread the good news about cancer—how it can be recognized in its early stages—how to get rid of it. Help to save lives.

Almost as many people over 40 die of cancer as of pneumonia, tuberculosis and typhoid fever combined. If—and when—cancer is successfully brought under control, the cost of life insurance will be reduced.

By dealing openly and frankly with cancer, by learning to recognize first symptoms, by acting promptly when it is discovered and, most important, by having thorough physical examinations annually or oftener, the cancer death rate can be materially reduced.

We shall be glad to mail to anyone interested, a leaflet on cancer entitled "A Message of Hope".

HALEY FISKE, *President.*


THE LIGHT THAT NEVER FAILS

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*Biggest in the World, More Assets, More Policyholders, More Insurance in force, More new Insurance each year*

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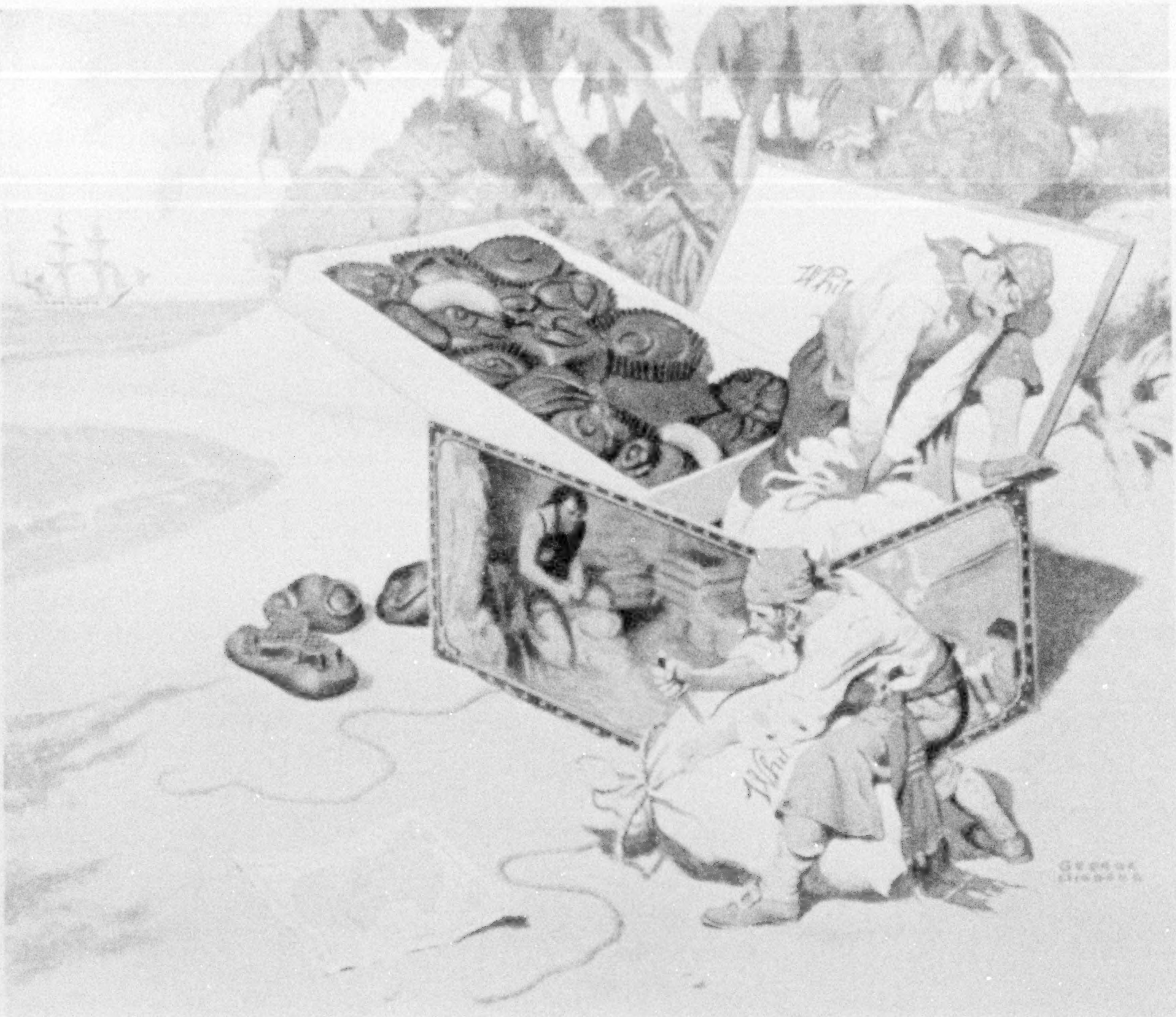

# *The joys of* PLEASURE ISLAND!

When you give a Pleasure Island package you give a box of most enjoyable chocolates in an attractive form, *and you give more*—for the box and contents express the elusive charm, the age-old romance and adventure that really belong to such chocolates, but which waited for a genius to capture and express them.

Hundreds of thousands of candy lovers have found the way to Pleasure Island through this package. Through it they have doubled their enjoyment of chocolates.

By your thoughtful gift help your friends loot this chest of treasured sweets, with its chocolate bullion of gold and silver and its chocolate "Pieces of Eight."

In one pound and two pound packages at the nearby store that is agent for the sale of

Whitman's
Pleasure
Island —
Chocolates

**Whitman's**

Chocolates

Vol. XLIX, No. 6 WASHINGTON June, 1926

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# THE CONQUEST OF MOUNT LOGAN

## North America's Second Highest Peak Yields to the Intrepid Attack of Canadian Climbers

By H. F. Lambart, B. Sc., D. L. S.

Deputy Leader of the Mount Logan Expedition and Member of the Geodetic Surveys, Department of the Interior, Dominion of Canada

Mount Logan, the loftiest mountain in the Dominion of Canada (19,850 feet) and ranking second only to Mount McKinley (20,300 feet), the highest point on the North American Continent, is situated in the extreme southwestern corner of Yukon Territory, only 21 miles from the Alaskan boundary.

Its summit is only 60 miles from the shores of the Pacific, and although on clear days it may be seen from a point 125 miles out to sea, the existence of this great mountain remained unknown until 1890, when Israel C. Russell, leader of the National Geographic Society-U. S. Geological Survey Expedition, saw it from a point of vantage on the foothills of the St. Elias Alps to the south.

"The clouds parted toward the northeast," says Mr. Russell in the report of his discovery to the National Geographic Society, "revealing several giant peaks not before seen, some of which seemed to rival St. Elias itself. One stranger, rising in three white domes far above the clouds, was especially magnificent. As this was probably the first time this summit was ever seen, we took the liberty of giving it a name. It will appear on our maps as Mount Logan, in honor of Sir William E. Logan, founder and long director of the Geological Survey of Canada." *

Apart from the South Polar Ice Cap and the island of Greenland, this region, of which Mount Logan is the predominating feature, presents probably the most intensely glaciated district of the globe. In its eternal solitude, its awful silence, its absence of any forms of life, vegetation, or running water, one sees a picture of the utter desolation which once existed during the great glacial periods of the earth's history.

Though rather difficult to define with accuracy, the region comprises some 12,000 square miles of Alaskan and Canadian territory, extending back from the Pacific coast more than 100 miles and reaching from the Bering Glacier on the west to Disenchantment Bay on the east, a distance of 125 miles.

### PROBABLY THE GREATEST MOUNTAIN MASS ON THE GLOBE

The main mountain system of this region has hitherto been referred to as the St. Elias Range, or Alps, since the great peak of that name was long considered the monarch of all the vast and nameless heights which constitute the range.

Mount Logan, now known to be the crowning peak of them all, lies 26 miles farther in from the coast, and is so obscured by intercepting ranges as to be hardly recognizable from the sea. It rises 14,000 feet above its surrounding glaciers, in a colossal mass of rock which appears,

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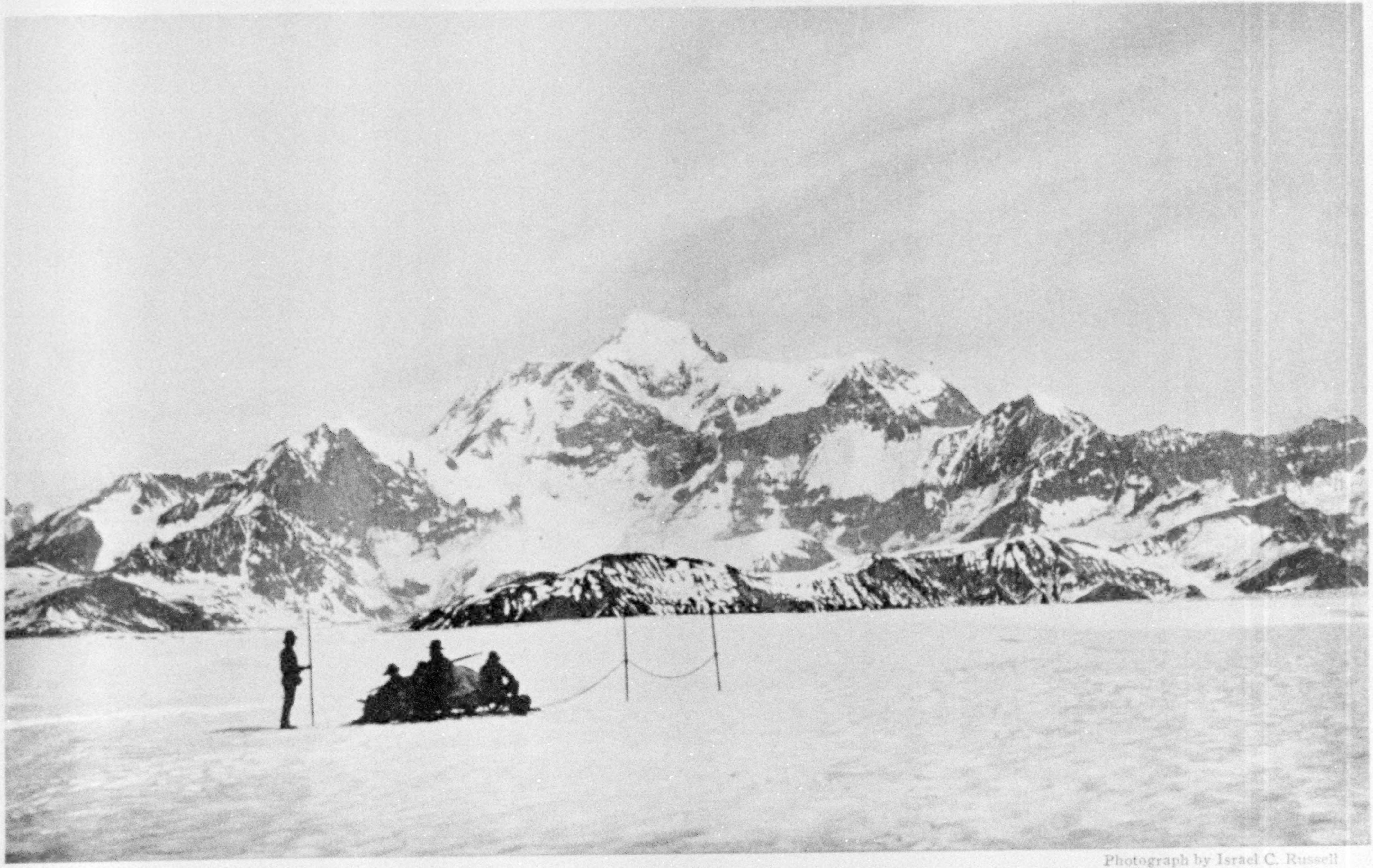
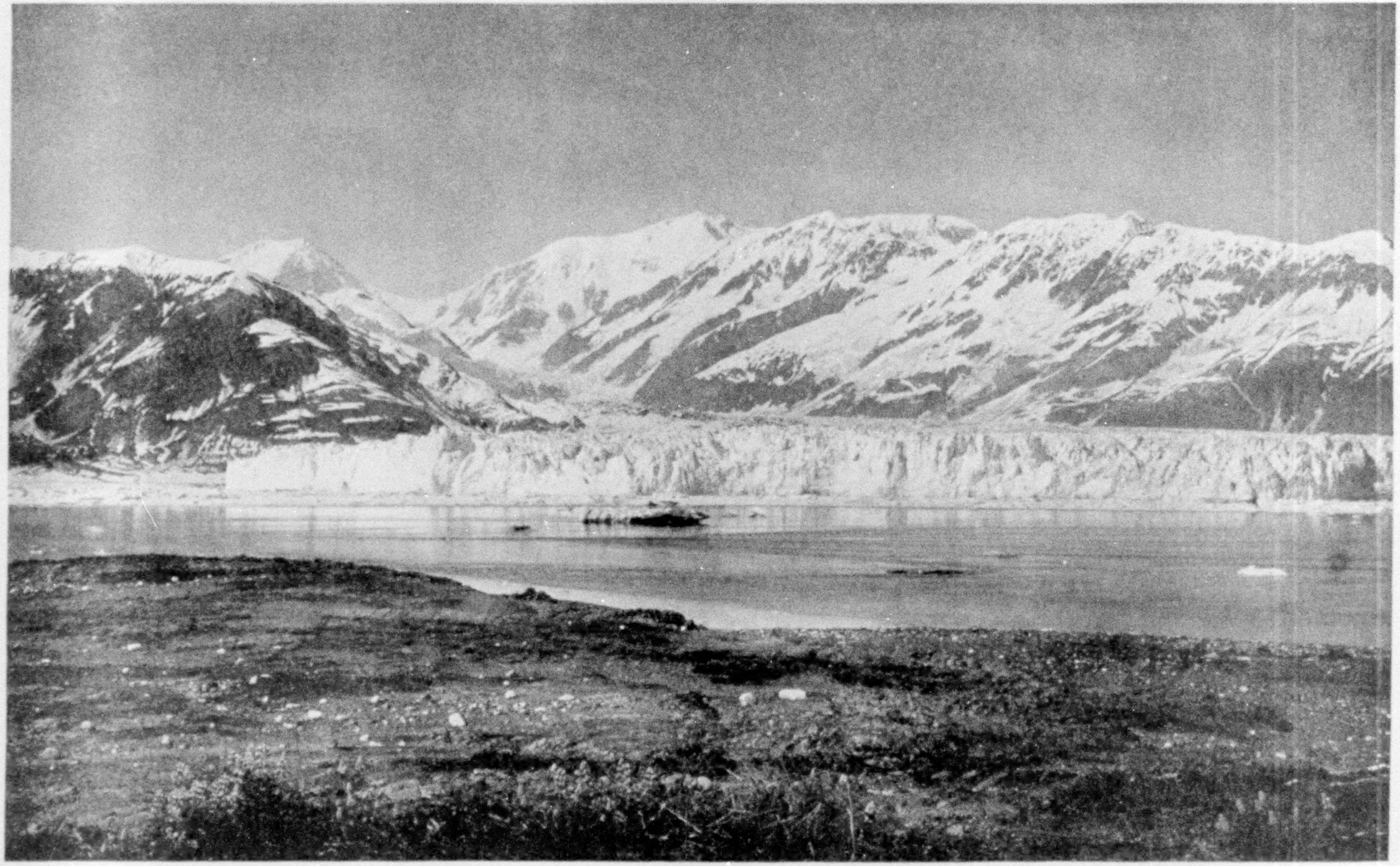
* See "An Expedition to Mount St. Elias, Alaska," by Israel C. Russell, in the National Geographic Magazine for May, 1891.



Photograph by Israel C. Russell

MOUNT ST. ELIAS (18,002 FEET) FROM LIBBEY GLACIER

Named by Vitus Bering in 1741 in honor of the patron saint of the day, Mount St. Elias was considered the monarch of the vast and nameless heights of the St. Elias Range until 1890, when, from a vantage point on the range's foothills, Israel C. Russell, leader of a National Geographic Society Expedition, saw rising above the clouds three white domes which he named Mount Logan in honor of Sir William E. Logan, founder and long director of the Geological Survey of Canada (see text, page 597).



Photograph by H. C. Fassett, courtesy of U. S. Fish Commission

THE FACE OF HUBBARD GLACIER, ONE OF THE LARGEST AND GRANDEST TIDAL GLACIERS ON THE NORTH AMERICAN CONTINENT

This vast ice stream was mapped and named by the same National Geographic Society expedition which discovered and named Mount Logan (see text, page 597). It was named in honor of Gardiner Greene Hubbard, first President of The Society. The glacier has its source far back among the snow-covered mountains, and it flows with almost no stain or débris, as a pinnacled and crevassed flood of pure-white ice. From its sinuous face, measuring from 4½ to 5 miles and towering from 250 to 300 feet above the water, there comes a continuous rumble, like thunder, as huge masses fall and float away as icebergs.

Photograph from H. F. Lambart

THE KENNECOTT MINE IN WINTER GARB, SHOWING LINE OF ORE BUCKETS

Three shifts, working day and night, keep this copper mine running constantly except for two days a year—Christmas and New Year's. The Copper River region ore was worked by the Indians for spear- and arrow-head metal before the white man arrived. Back of the mine is the snow-covered terminal moraine of a glacier.

from specimens taken at an elevation of 18,500 feet, to be chiefly of biotite-diorite gneiss—a coarse-grained granitic rock.

The mountain can be regarded, I believe, as the greatest in point of mass to be found upon the globe. The north and south walls present gigantic precipitous cliffs of sheer rock, so steep that no snow can lodge upon them, while the east and west extremities of the mass are marked by two subsidiary peaks, one on either side—McArthur (14,400 feet) on the east and King (17,130 feet) on the west.

It was not, however, until the publication of the photographs taken by Vittorio Sella, of the Duke of the Abruzzi's famous expedition, which conquered Mount St. Elias, that any true conception was obtained of the immense bulk of the Logan massif. If this mountain were cut through at the 16,000-foot level, it would be found to be 11 miles in length in an easterly and westerly direction and would consist of a plateau 30 square miles in area above the 16,000-foot level.

### ALPINE CLUB OF CANADA PLANS TO CONQUER PEAK

On this great mountain mass is an amazingly complicated system of glaciers, snow fields, ridges, and peaks, rising from 18,000 feet at the extreme western end to the very summit on the eastern.

It belongs to the strength and glory of human nature that when men are confronted with the unknown, the perilous, the impossible, daring spirits are straightway challenged to embark upon an enterprise of life and death in order that secrets may be dragged forth and the apparently impossible achieved.

As soon, therefore, as it was known that far to the north a knightly and defiant peak, cut off from civilization by rivers of ice and entrenched among a

Photograph by Fred H. Moffit

THE BONANZA MINE AND TRAMWAY FROM A RIDGE BETWEEN KENNECOTT AND MC CARTHY CREEK

A green patch on a mountain side, at first thought to be grass, led to the discovery of this tremendously productive mine. The patch proved to be a rich outcropping of copper ore.

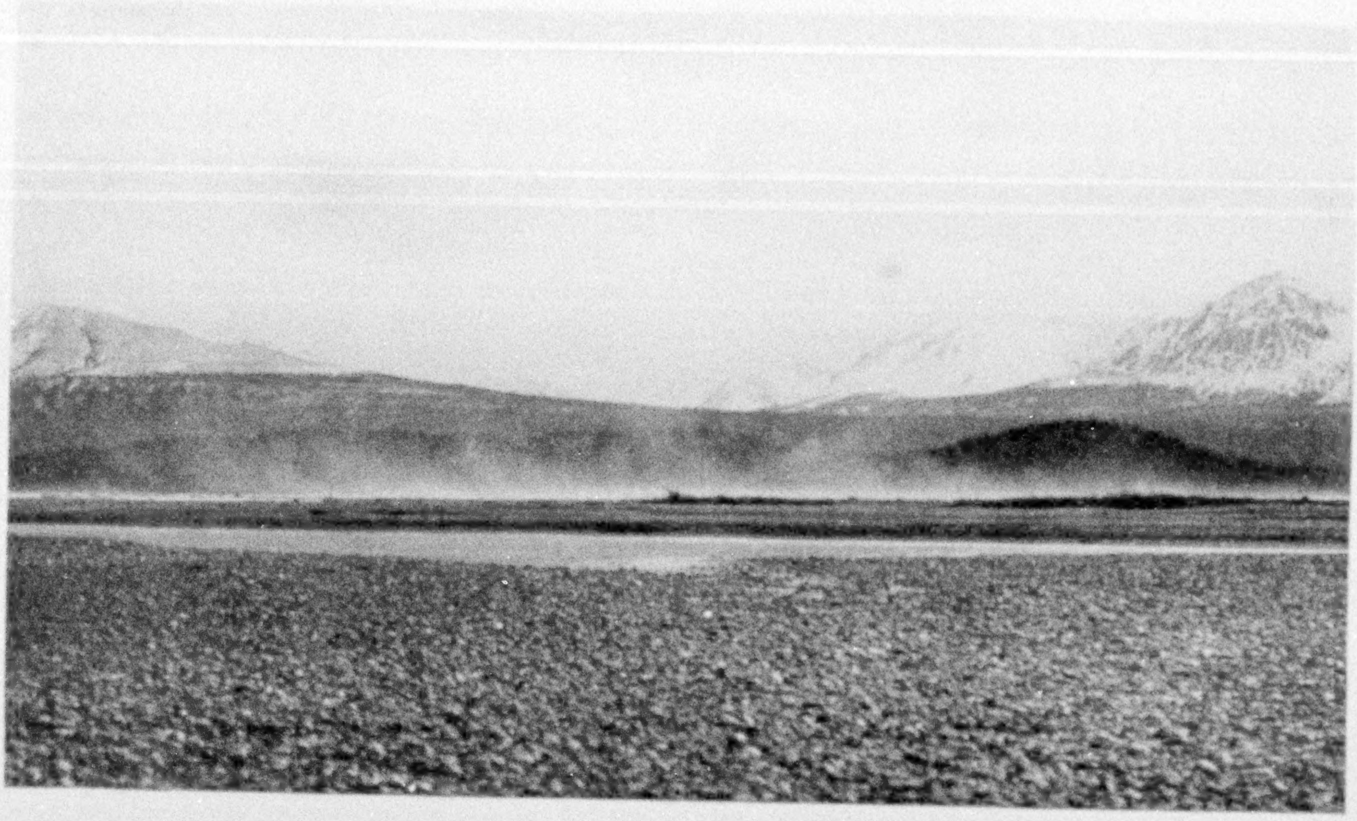
thousand barriers of snow, lay waiting the coming of man, the mountaineers of this continent began to turn their eyes to Mount Logan and to dream their dreams of its conquest.

It was not, however, until 1922 that Prof. A. P. Coleman, of the University of Toronto, veteran geologist and mountain climber, presented to the Alpine Club of Canada the suggestion that a serious attempt should be made to conquer the mountain. In the autumn of 1923 this club appointed an executive committee and tentatively named the personnel of the climbing party. The sister alpine clubs of Great Britain and the United States were asked to send representatives, and thus the expedition assumed an international character.

### THREE AVENUES OF APPROACH

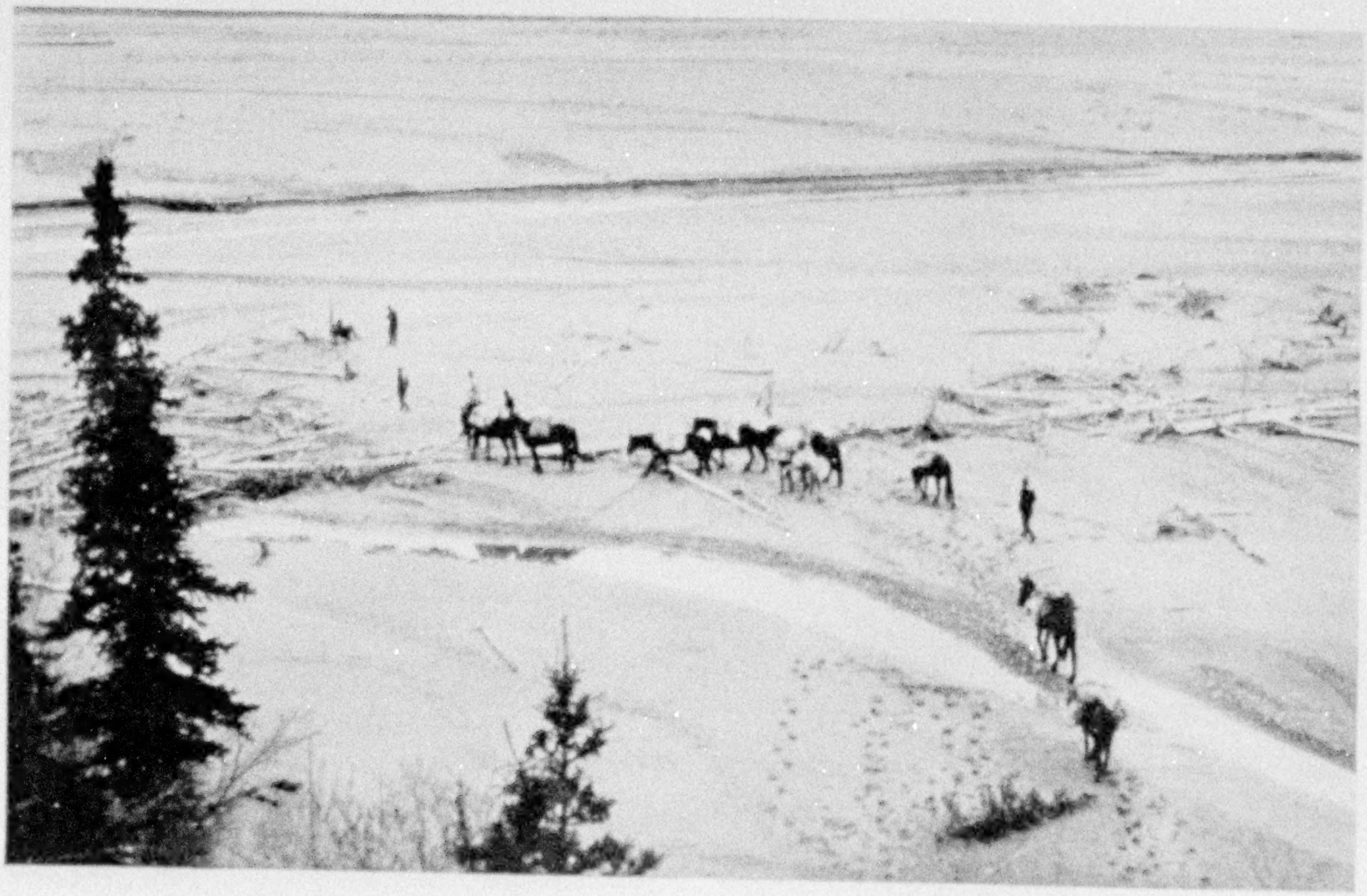
The expedition leaders hoped to make the attempt during the summer of 1924, but the shortness of time available for preparation, together with the lack of sufficient financial backing, made this impossible. The delay of one year, however, enabled Mr. A. H. MacCarthy, of Wilmer, B. C., the leader, to make a preliminary reconnaissance, which was of incalculable value to the enterprise.

The first duty of the expedition was to



A SAND STORM IN THE CHITINA RIVER VALLEY, NEAR ITS HEAD

During warm afternoons, the west winds frequently blow up dust storms of great intensity. The Expedition noted dust clouds being blown for 50 miles beyond the flats of the river (see below) toward Logan Glacier.



Photographs by Henry S. Hall, Jr.

THE PACK TRAIN ON ITS WAY UP THE CHITINA RIVER VALLEY

The valley floor is a gravel flat some 60 miles long and five miles wide, cut by many swift-water channels in summer. The pack train kept to the flat except when a channel forced it to travel on the bank and through the woods.

Photograph by H. F. Lambart

GOING INTO THE FIRST CAMP ON THE BARS OF THE CHITINA RIVER

This was half a day's run from Rush Pond, where the Expedition stopped for luncheon on the way in.

find a point of attack. Three avenues of approach presented themselves: First, the Kluane Lake route, by way of the White Pass and Yukon Railway, to Whitehorse; thence to Kluane Lake by wagon road. This route proved entirely impracticable, as a gap of nearly 60 miles of unexplored and heavily glaciated territory exists from the lake to the eastern end of the mountain.

Second, a route similar to that followed by the Duke of the Abruzzi in reaching the summit of St. Elias—a straight course up the Malaspina Glacier direct from the Pacific coast near Yakutat Bay, 60 miles to the Seward Glacier, and thence by this glacier to the foot of the Logan massif, and from there around to its southwestern side.

An examination of the photographs taken from the summit of St. Elias revealed the fact that there were no feasible approaches along the south face, and that the snow cornices were perilously heavy, occasioning innumerable avalanches. Furthermore, it was known that the moisture-laden atmosphere from the Japanese current coming in from the coast caused incessant fog in this region. It was, therefore, agreed that this route also was impracticable.

There remained the third course, by way of Cordova, on the Alaskan coast, over the Copper River and North Western Railway, 191 miles, to the little frontier town of McCarthy, and thence by way of the Chitina River Valley, 88 miles by pack train, to the foot of the Chitina Glacier. From that point the approach led across the Chitina and Walsh glaciers, on

Photograph by A. M. Taylor

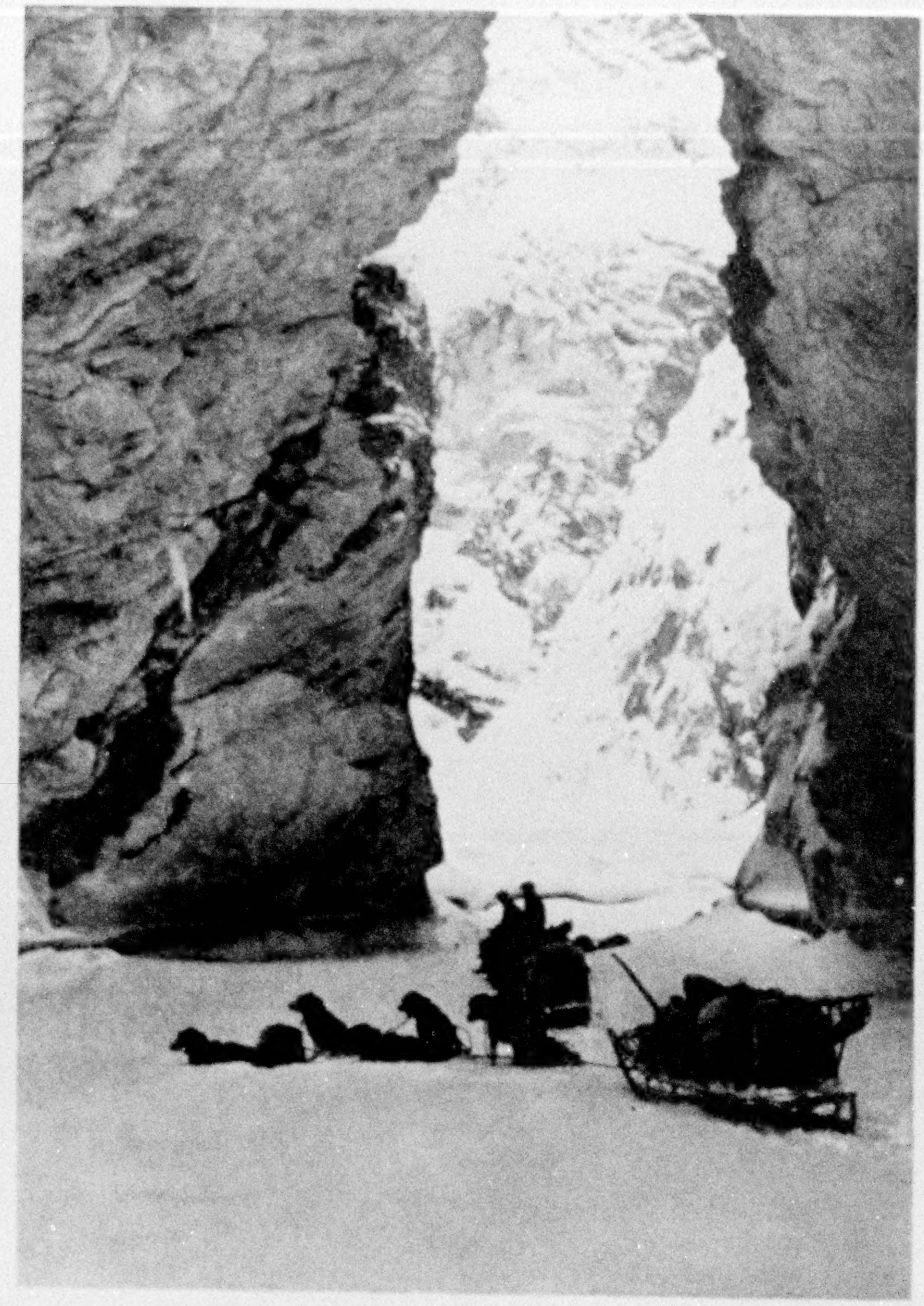
GOOD GOING WITH THE SLEDGES: LOGAN GLACIER

Dog teams were used only by the winter party which laid down supplies (see text, page 605).

Photograph by H. F. Lambart

HARD SLEDGING ON LOGAN GLACIER (SEE TEXT, PAGE 609)

From this point forward the Expedition traveled during the early morning hours, in order that the hard-frozen crust of snow could facilitate the use of the hand sledges. When the snow softened, however, or at stretches of chaotic ice, immense labor was involved. The sledges carried from 300 to 500 pounds, and the pulling was done in rhythm, the leader setting the pace. The western end of the Logan massif shows in the distance.



Photograph by A. M. Taylor

TREACHEROUS SLEDGING IN THE "GORGE OF FATE"

Through this seven-mile canyon on the south margin of Chitina Glacier and the north wall of the valley, the Expedition's provisions and equipment were transported the winter before from the Chitina Valley to the upper stretches of Chitina Glacier (see text, page 607).

to the smoother surface of the Logan Glacier, which carries a straight course in an easterly and westerly direction and continues to its source, beyond the foot of the steep north face of the Logan massif.

The Chitina Valley and Logan Glacier route was well known through the exploration of the International Boundary Surveys in 1912 and 1913.

Both the leaders of the expedition (MacCarthy and Lambart) decided that this last line of approach offered the best chances of success.

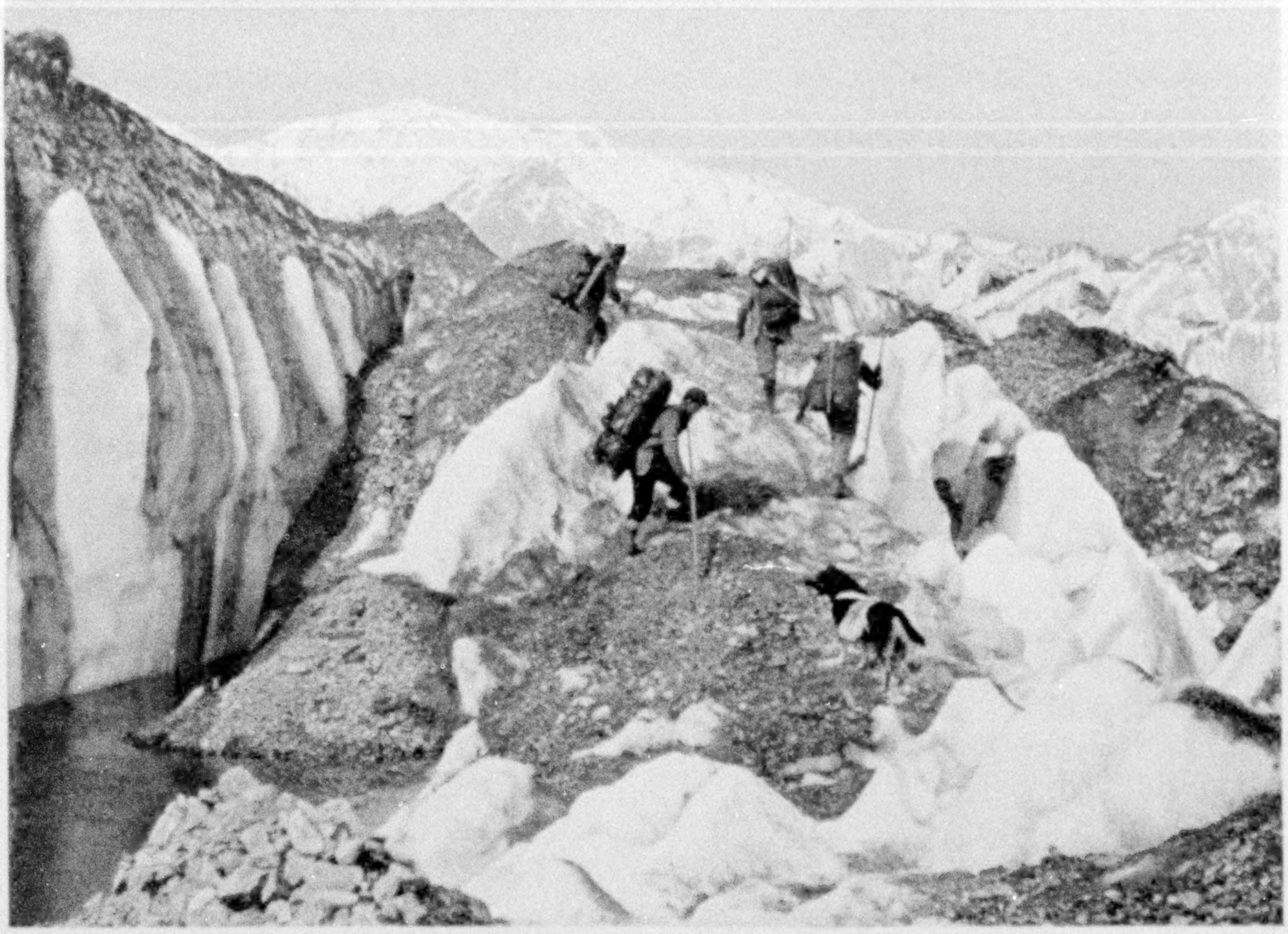
It is one thing, however, to plan a route on a contour map and quite another thing to follow it through the actual territory. To test the feasibility of the plan Mr. MacCarthy undertook to go over the projected route in advance.

This reconnaissance was carried out successfully during June and July in 1924. Traversing the valley of the Chitina River, the leader and his pack train reached the foot of the Chitina Glacier. Here, abandoning the horses, he and his men laboriously packing on their backs the bare necessities of life, succeeded in ascending the great glacier for 50 miles, to the foot of King Glacier, which lies at the western end of Mount Logan.

The result of this summer patrol, in which Mr. MacCarthy in 44 days covered 552 miles, completely confirmed the decision as to the route to be followed. Furthermore, owing to the distance to be covered before reaching the mountain itself and the impossibility of conveying the necessary supplies for the expedition without using a small army of packers, it was decided to employ a winter freighting party to lay down advance caches of supplies along the route and to deposit the bulk of the equipment as near to the base of the mountain as possible.

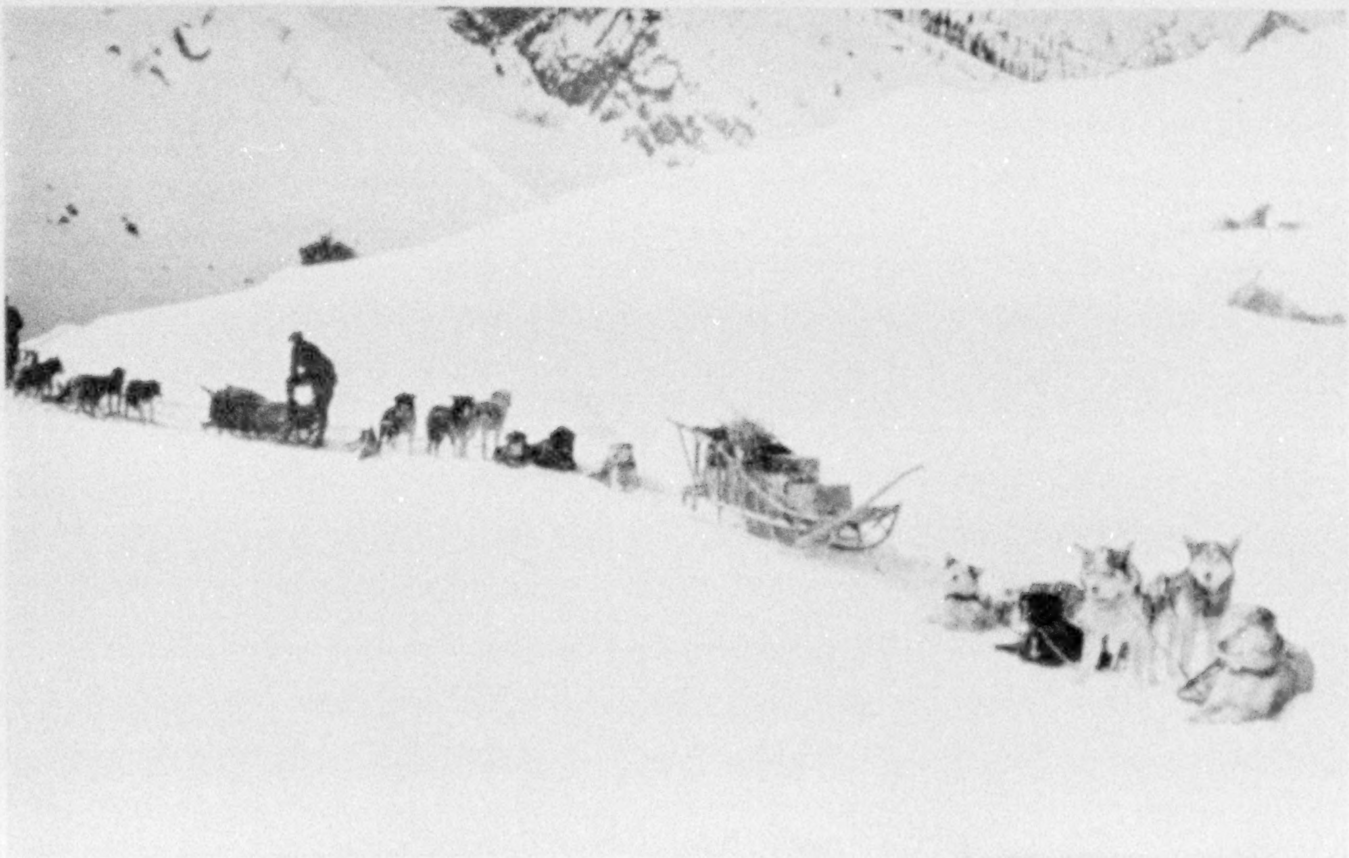
### WINTER FREIGHTING PARTY PREPARES THE WAY

On February 15, 1925, the freighting parties pulled out from the town of McCarthy with 19,000 pounds of supplies, equipment, and fodder (over 50 per cent of which was cached or consumed en route).



Photograph Courtesy Internat'l Boundary Com.

BACK-BREAKING WORK: PACKING SUPPLIES ACROSS CHITINA GLACIER



Photograph by A. M. Taylor

WEARY DOG TEAMS RESTING ON THE TERMINAL MORAINE OF CHITINA GLACIER

During the preparatory winter freighting operations, supplies and equipment were transported from McCarthy to Advance Base Cache on the Ogilvie Glacier. Horses and dogs broke the first 88 miles of the trail to Chitina Glacier, but, once the ice was reached, dogs alone were relied upon (see text, page 607).

Photograph by D. W. Eaton, Courtesy Internat'l Boundary Com.

AT THE JUNCTION OF THE CHITINA AND LOGAN GLACIERS

It was an arduous undertaking to make such a journey in the depth of winter, over incredibly difficult terrain, breaking trail the entire distance, and enduring Arctic cold and biting gales.

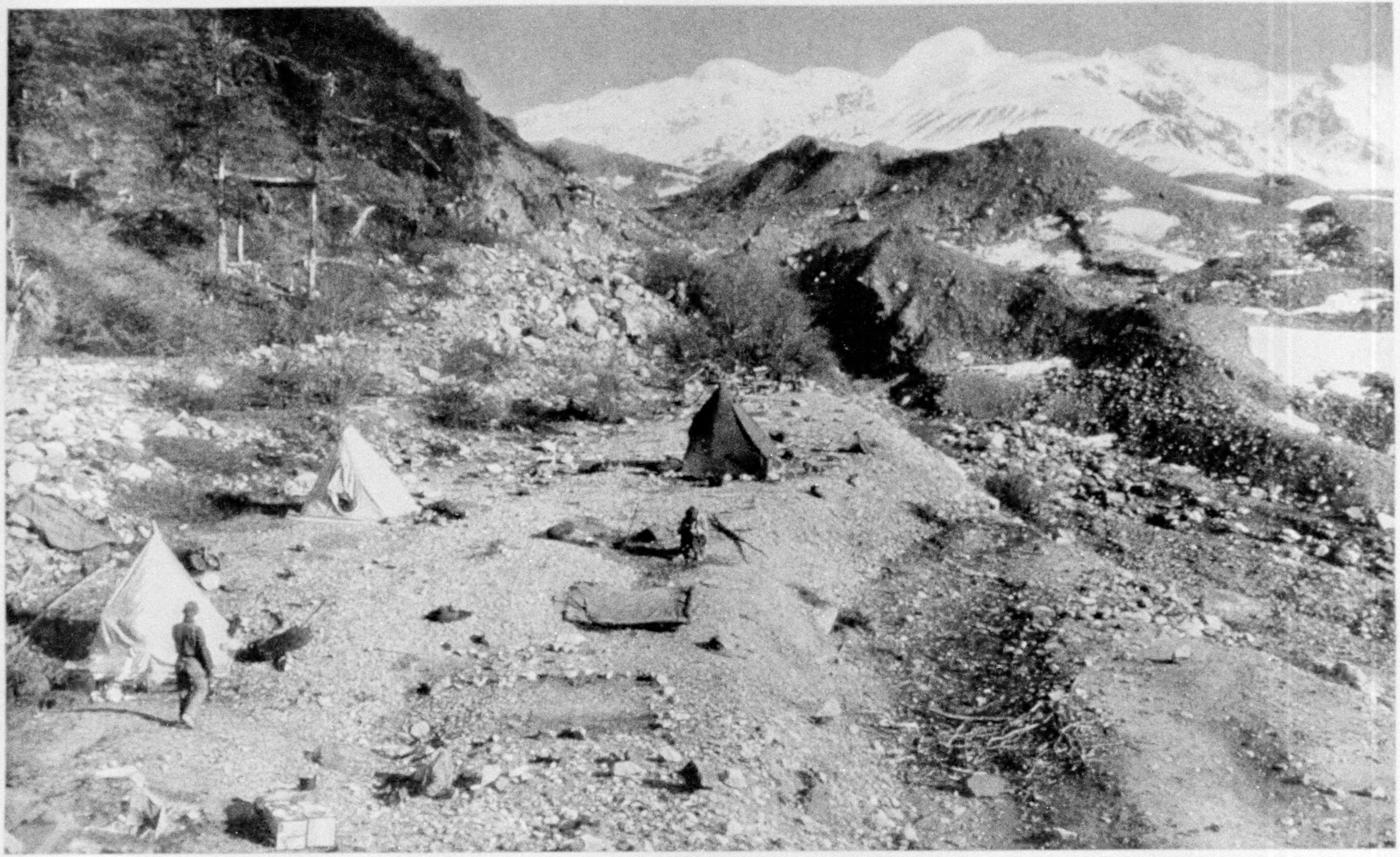
The first 88 miles to the foot of the Chitina Glacier were accomplished in 17 days by the use of horses and dogs. Once the ice was reached, however, the party had to rely upon the dog teams alone, and the wearisome business of relaying load after load across moraine and around crevasses began.

At this juncture a most critical decision had to be made. Hitherto the few parties which had traversed the glacier had followed its northern shore, deeming the southern quite impassable. Mr. MacCarthy himself in his summer reconnaissance had taken that route; but now, faced with a tremendous task and a very small margin of time in which to achieve it, Mr. MacCarthy and his right-hand man, Mr. A. M. ("Andy") Taylor were drawn to consider the shorter but infinitely more hazardous route by the south shore.

They discovered that between the wall of the glacier and the land there was a deep canyon, through which flowed a turbulent, icy stream, which had, as the winter wore on, fallen lower and lower, leaving ice ledges protruding from the canyon face to mark its former level (page 605).

Could they penetrate the gorge on these precarious flat shelves of ice? It was a fateful question for the expedition. If they failed, the attack on the peak could not be made that year, as the supplies would not be in position. They decided to take a chance; they gambled on their ability to get through, and they won.

During the month of March the entire equipment was relayed along this incredible route, eight camps being established



Photograph by H. F. Lambart

THE BALDWIN-FRASER BASE CAMP OF THE INTERNATIONAL BOUNDARY COMMISSION

This is the site of the old survey camp of 1913, below the Walsh and opposite the mouth of the Baldwin glaciers, from where Baldwin and Fraser made an almost successful attempt to conquer Mount St. Elias. Here the Mount Logan Expedition spent its last night on land for six weeks (see text, page 609).

from three to seven miles apart. The equipment was cached at "Turn," the junction of the Ogilvie and Logan glaciers, and an advanced base camp was set up seven miles nearer to the foot of the mountain.

In April Mr. MacCarthy and his men were back in McCarthy, having by their preparations made possible the assault on the great peak. The news of this success heartened the climbing party, which was on the eve of departure for the great adventure.

### MEMBERS OF THE EXPEDITION START FROM SEATTLE

On May 2, 1925, the Mount Logan Expedition sailed from Seattle.

The party comprised Allen Carpe, Lieut.-Col. W. W. Foster, R. M. Morgan, Henry S. Hall, Jr., N. H. Read, H. M. Laing, government biologist, and the author—men facing the unknown, full of confidence and hope.

After an uneventful but magnificent voyage up the Pacific coast, the party arrived at Cordova on May 7 and joined Mr. MacCarthy. The following day we proceeded to McCarthy over the Copper River & North Western Railway.

It is doubtful if any other railway on this continent passes through scenery of such majesty and beauty. Those stupendous glaciers, the Childs and the Miles, seem as if they would obliterate the line, so close do they come, while above and around tower the mighty peaks whose eternal fields of snow and ice give them birth.*

At McCarthy the party was completed by the addition of Mr. Taylor.

Three days were given over to the preparation of equipment, and on the morning of May 12 a pack train of six horses and four mules passed through the streets of McCarthy, and the Mount Logan Expedition was on its way.

It was a clear morning and much snow and ice still lay on the river beds, but the soft gray of the pussy willows gave promise of the conquering spring.

The sixth day out from McCarthy we reached the end of the trail and were faced with the necessity of cutting down our kit, as from this point everything had to be carried on our own backs. It was with mental anguish that we parted with this and that personal treasure, but it had to be done. We were beginning to realize the enormous task which confronted us and how vital it was that the last ounce of strength should be conserved for the actual climb.

As we bade au revoir to the pack train, which disappeared in the direction of McCarthy, we realized that now we were facing the test of our lives.

The morning of May 19 dawned gloomy and wet, but before long the clouds began to rise and give promise of a better day. A steady grind of three hours brought us to Chitina Point, where we made camp at the cache deposited by the winter freighters. We now further reduced the dead weight of our packs and swung up among the branches of a friendly spruce many discarded portions of our equipment.

We followed along the margin of the Walsh Glacier, managing to get good footing on game trails, and through stretches of alpine meadow, and were only forced out on to the surface of the rough moraines near the end of the day's journey. Our camp that night was in the last timber and verdure we were to see until our return.

### THE FIRST OF FORTY-FOUR NIGHTS ON OPEN ICE

Three days later we made 16 miles up the Logan Glacier to another of our advance caches, where, in addition to needed supplies, we secured the snowshoes so indispensable for the coming journey.

That night we spent on the open ice, the first of 44 thus passed before we turned our backs on the everlasting winter of that region.

From this point it was necessary to use the early morning hours for travel, in order that we might have the hard crust of snow which had frozen overnight, for the noonday sun caused such melting as to make it almost impossible to draw a sledge (see page 604).

After a royal breakfast of porridge, bacon, eggs, and coffee, at 1 o'clock on the morning of May 23 the sledges were loaded, snowshoes adjusted, and we were

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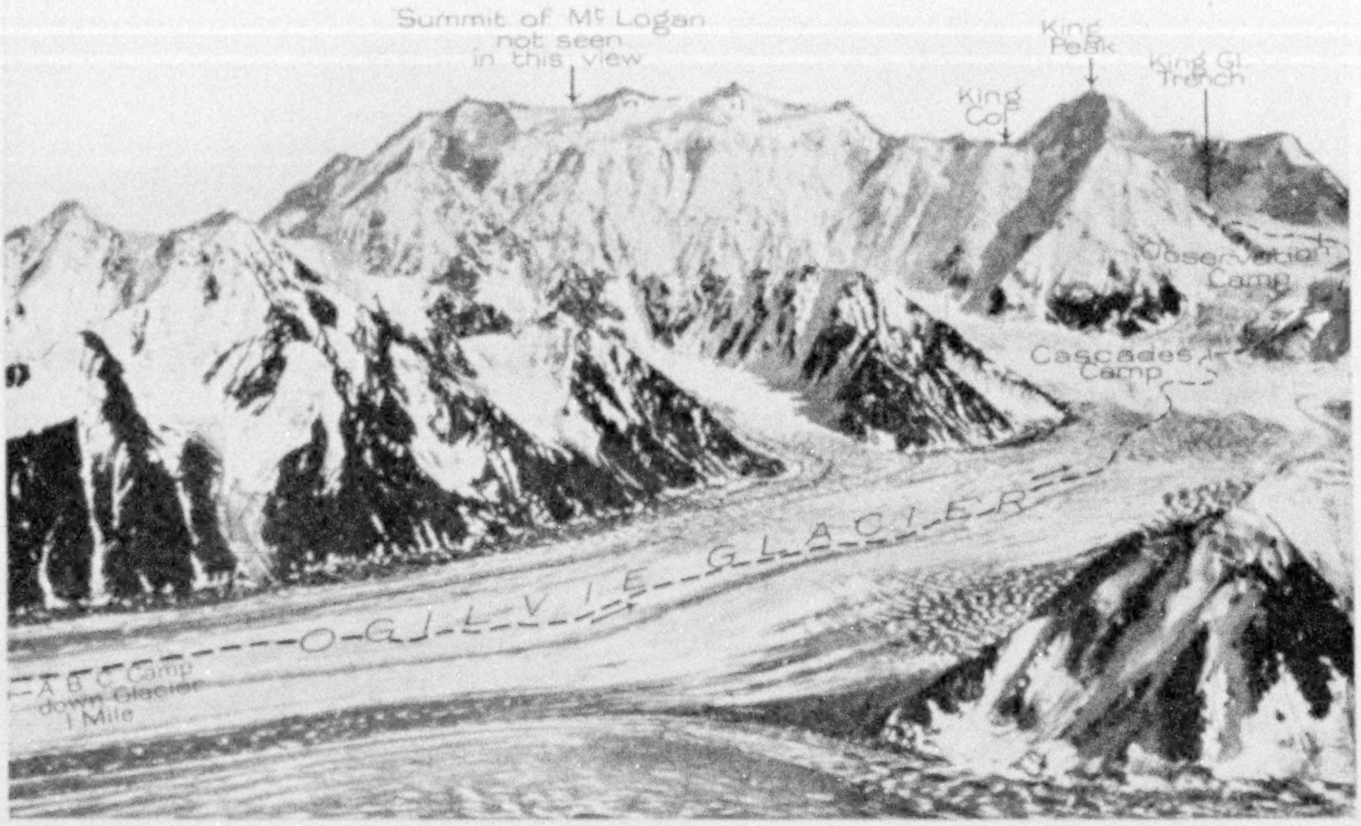
* See "Researches in Alaska," pages 537-560, in the NATIONAL GEOGRAPHIC MAGAZINE for June, 1911.



Photograph by T. C. Dennis

THE TRAIL OVER GLACIER AND PEAK

This view of the western mount of Logan massif (center) was taken from a triangulation station of the International Boundary Surveys of 1913. After the pack animals were sent back to McCarthy, a grinding struggle of 36 days finally brought the Expedition to their goal on the evening of June 23.

off. It was at first an immense relief to be rid of the intolerable packs, but as the snow surface became soft and as we ran into stretches of chaotic ice, over which the sledges had to be manhandled with great effort, we realized that, with all its pain, back-packing under certain conditions was on the whole easier.

The next day we came to rest on one of the medial moraines of the Ogilvie Glacier, two miles above where it joins the great lateral moraines of the Logan. At this place (Turn) we found new comfort in the cache of stores and equipment left by the winter expedition (see text, page 605).

For the first time, we slept that night on air mattresses, which are condemned by many writers, but which were a great boon to us and were used in the very highest camp, proving effective insulators against the ice. Being inflated by a light pump, they were easily made ready and through the severest weather gave us not the slightest trouble.

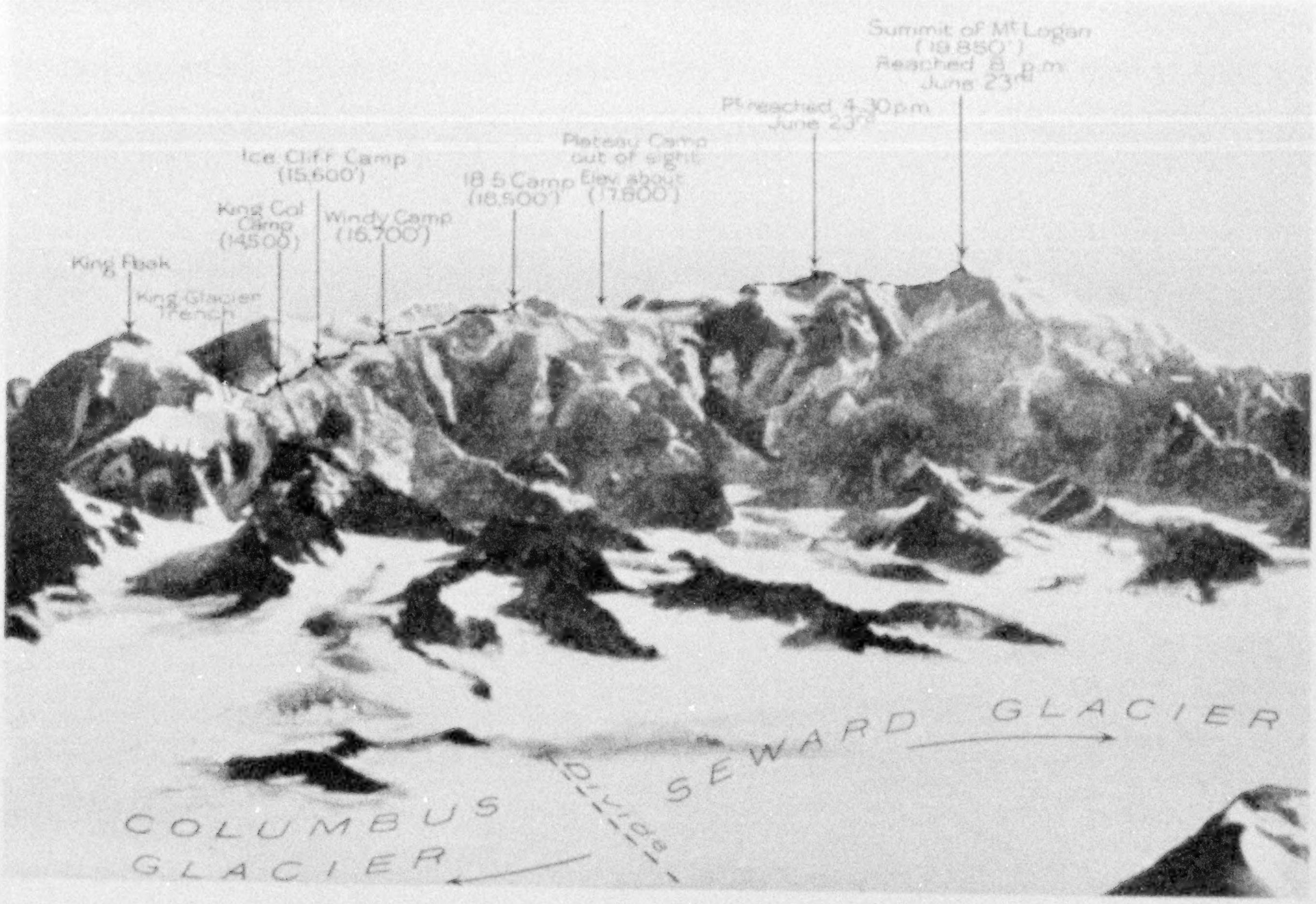
Following a day of needed rest in camp, we left the broad valley of the Logan and struck out on the surface of the Ogilvie Glacier, which sweeps down 12 miles from the south, where it rises in a basin fed by a number of small glaciers entering it like spokes of a mighty wheel. At its head is an ice cataract 2,000 feet high.

A short run of seven miles brought us to the last main cache established by the winter party. Here we found the bulk of our equipment, and stores sufficient to sustain 10 men for more than 60 days.

For eight days (May 26 to June 3) we were busy transporting the greater part of these supplies five miles farther up the glacier to the Cascades (see page 612), from which point the actual ascent of Mount Logan was to begin, the first effort being a relay of our loads 1,000 feet above, to a point we named erroneously Quartz Ridge (see page 613).

We had now reached "the jumping-off trench" for the actual assault on the mountain.

After long consultation we allotted ourselves 28 days for the attack on the moun-


Summit of Mt Logan
(19,850')
Reached 8 p.m.
June 23rd
Pt reached 4.30 p.m.
June 23rd
Plateau Camp
out of sight
Elev. about
(17,800')
18.5 Camp
(18,500')
Ice Cliff Camp
(15,600')
Windy Camp
(16,700')
King Col
Camp
(14,500)
King Peak
King Glacier
Trench
SEWARD GLACIER
DIVIDE
COLUMBUS
GLACIER

Photograph by Vittorio Sella

THE ROUTE WHICH LED TO CANADA'S HIGHEST SUMMIT

This photograph, taken from the top of Mount St. Elias, 26 miles distant, shows the south face of the Logan massif and the trail and camps made by the Mount Logan Expedition in its climb.

tain. This decided, we selected the necessary supplies and packed them in sacks, each of which contained eight men's rations for two days.

A unique feature of our equipment was the inclusion of 1,000 willow wands, with which we proposed to mark the trail. These wands, about 3 feet in length, were stuck into the snow at intervals of about 100 feet, on the right side of the trail. They proved veritable beacons upon the snowclad slopes of the mountain (see pages 618 and 624).

### KING GLACIER HELD THE KEY TO SUCCESS

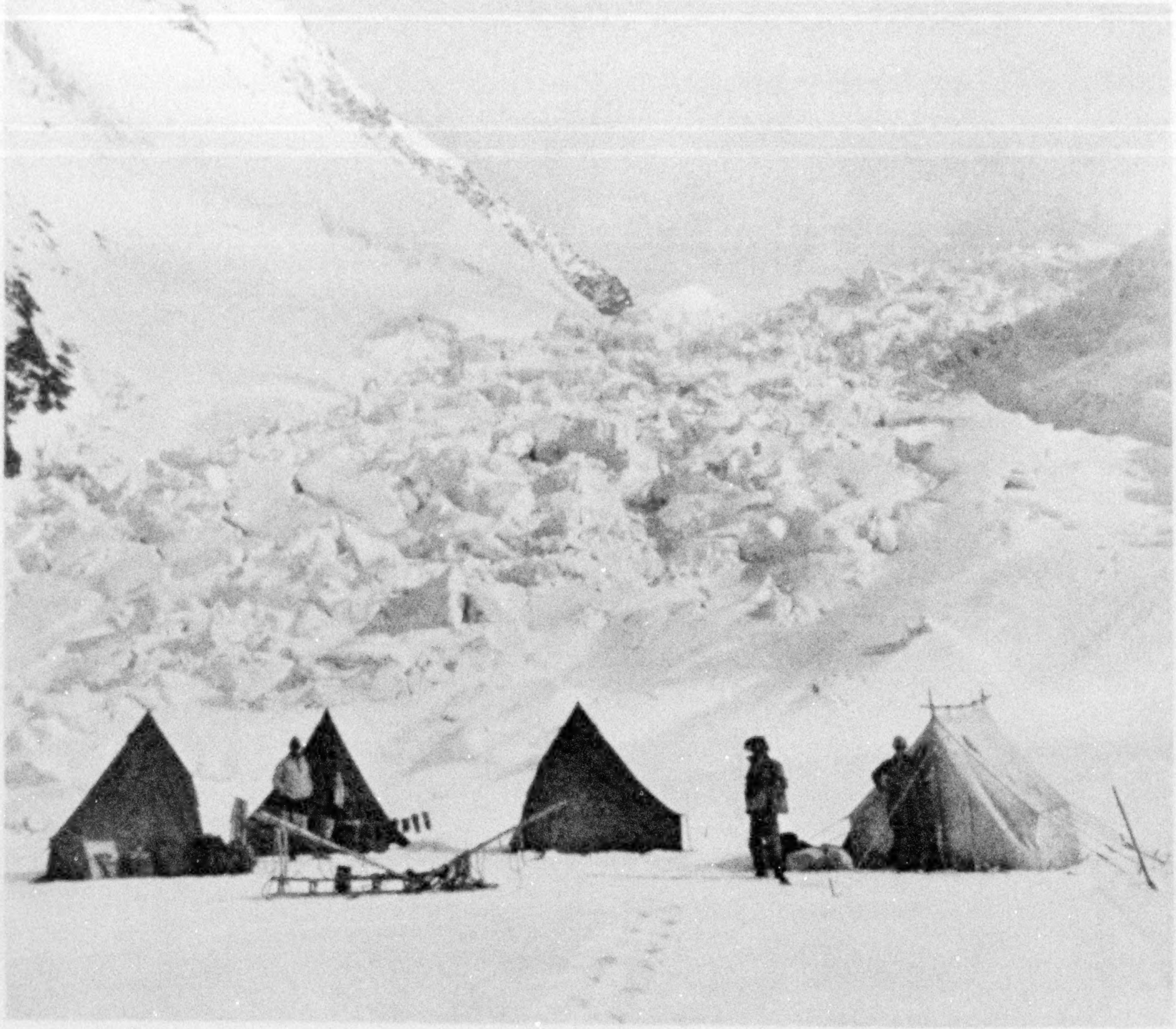
It was from the Cascades Camp (7,800 feet) that we got the answer to a critical question, which had been in the leaders' minds ever since they decided on a line of approach: Does the King Glacier, which takes its rise above the icefall of the Cascades, give access to the upper heights of Logan?

The Boundary photographs taken in 1913 showed the Cascades guarded by towering portals of rock and ice; they also showed the sweeping curve of the King Glacier, and those from St. Elias revealed the very summit of the glacier itself below the frowning cliffs of King Peak, but of the intervening reaches, and whether they ended abruptly in vast cliffs or led by gradual ascent up to the high levels of Mount Logan, no one could say.

If a reconnaissance from Cascades Camp had revealed that the King Glacier led into some cul-de-sac of ice cliffs, the whole expedition would have been turned back and forced to traverse the base of the mountain, seeking another line of ascent. Had that proved necessary, it is not likely that Logan would have been conquered in 1925.

When the leaders of the party resolved on the route to be taken, they risked everything on the possibility of getting on to the mountain by way of King Glacier. Was it to prove an impassable barrier or an open door?

Imagine with what keenness a reconnaissance party left the Cascades Camp, skirted the icefall, and came to a point



Photograph by H. F. Lambart

WHERE THE CLIMB BEGAN: CASCADES CAMP ON OGILVIE GLACIER

From this base camp—elevation, 7,800 feet—the Expedition commenced the actual ascent of the Logan massif through the icefall at the back, which tumbles from King Glacier (see, also, page 616) past Logan's westernmost spur.

from which a clear view of the King Glacier was to be had. Imagine with what elation they saw that the way was clear—that by the narrow trench of the glacier the heights could be reached!

With a few photographs, taken at a great distance, as our only guide, we had guessed the existence of this narrow defile, and we had guessed right.

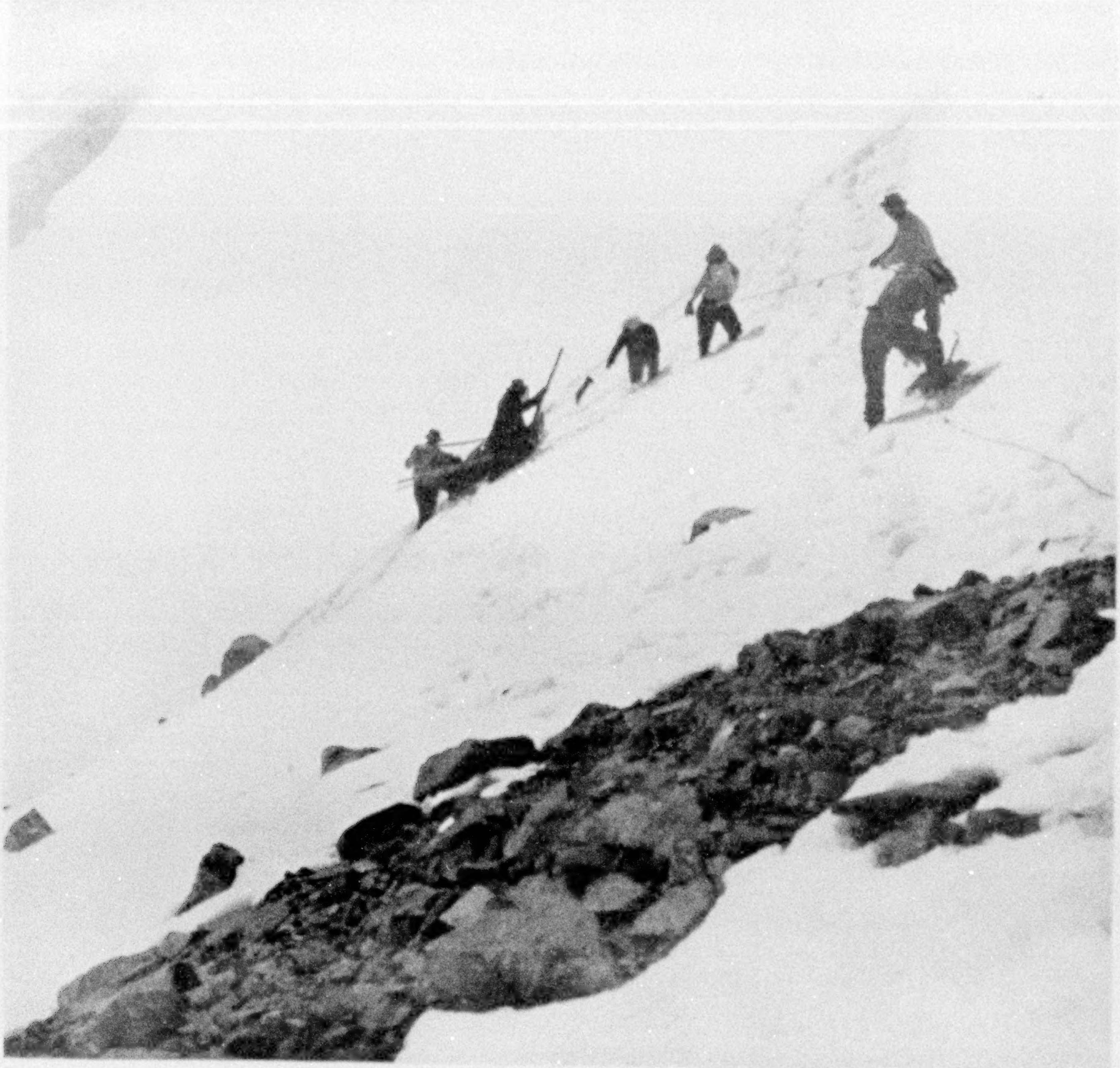
The spirits of the whole party soared at the news. With increased vigor we gave ourselves to the heavy labor of transporting our supplies up to a site on the King Glacier which we called Observation Point (see illustration, page 624).

### A SLASHING BLIZZARD FORCES A RETREAT

By June 4 we were consolidated at this new height, full of confidence, but weary and suffering from blistering sunburn, caused by the intense reflected glare from the snow. Our faces were peeling and our lips were cracked and bleeding.

Under ideal weather conditions we began the ascent of the King Glacier on June 5. For four and a half miles we had comparatively good going with our loaded sledge; then a great fall of ice blocked further progress.

Abandoning the sledge, we took our packs and made our way up the icefall. We had reached the top and were almost at the saddle, or col, which marks the head of the King Glacier, when there was a sudden change in the weather and we confronted a slashing blizzard, which forced us to abandon our packs and return to Observation Camp.



Photograph by H. F. Lambart

HOISTING A HAND SLED WITH A 700-FOOT ALPINE LINE TO THE SUMMIT OF QUARTZ RIDGE

The next day, with a fresh load of supplies, we succeeded in making the King Glacier col. But here we received a disconcerting shock. Instead of connecting with the heights above, the saddle brought us up abruptly at the foot of a tremendous face of ice and snow.

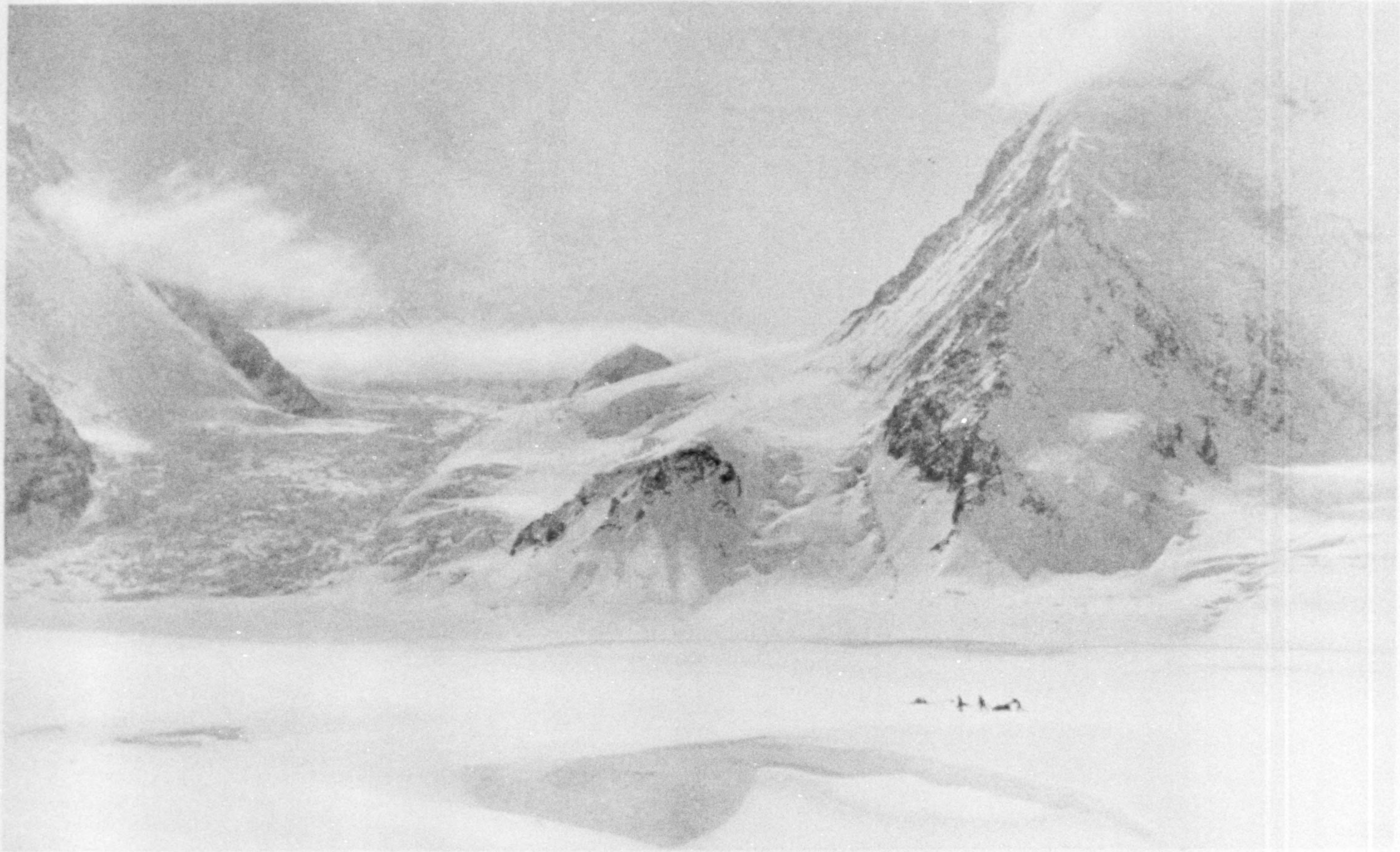
It was decided to make a reconnaissance, ascending the east arête of King Peak to ascertain whether there was a possible route over the barrier which loomed before us.

The report of the members of this party on rejoining the others that night at Observation Camp was cheering; they were satisfied that the ice slope was not unscalable and that a feasible route could be worked out.

Camp at 13,875 feet was finally consolidated in the open sweep of the col (see page 618). In the distance rose King Peak, the loveliest of them all, down whose terrifically steep face the avalanches ever tumble (see page 622).

The eastern end of the King col terminates in a precipitous drop of more than a mile of sheer cliffs to the surface of the Seward Glacier, a most overpowering sight.

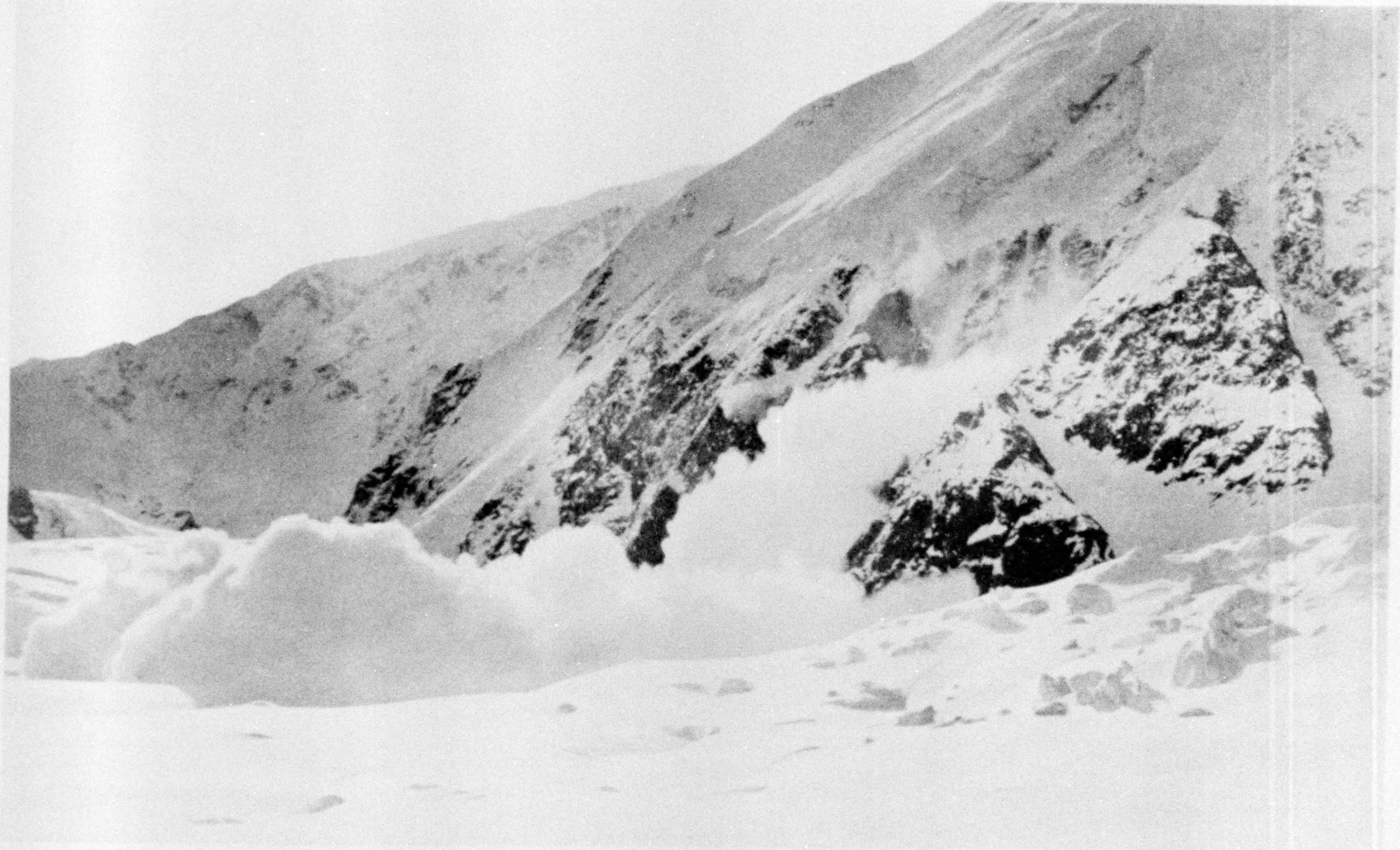
The surface of the ice was clear of snow and the members of the reconnaissance party had made rapid time, using crampons and picking their way through a chaos of ice. After climbing more than 1,000 feet, they were barred apparently by a great crack through which, thousands



Photograph by H. F. Lambart

ICE CASCADES AT THE HEAD OF OGILVIE GLACIER

The cascades descend from the King Glacier ice fields, 1,500 feet above. In the foreground are the névés of the Ogilvie Glacier.



Photograph by H. F. Lambart

AN AVALANCHE NEAR THE FOOT OF THE ICE CASCADES: OGILVIE GLACIER (SEE, ALSO, PAGE 614)

Photograph by H. F. Lambart

CASCADES CAMP AT THE FOOT OF OGILVIE GLACIER

The Expedition reached this camp site at the foot of the King Glacier, elevation 10,300 feet, by working its way through the ice at the left (see pages 612 and 614).

of feet below, the rocky precipices of the south face could be seen.

To their delight they discovered a point where, under a great overhanging block of ice, the chasm was bridged with snow (see pages 620 and 621). This was subsequently called MacCarthy's Gap, after the expedition's sturdy leader. Over this the party passed and, still climbing, came at last to the upper plateaus, at an elevation of 17,000 feet.

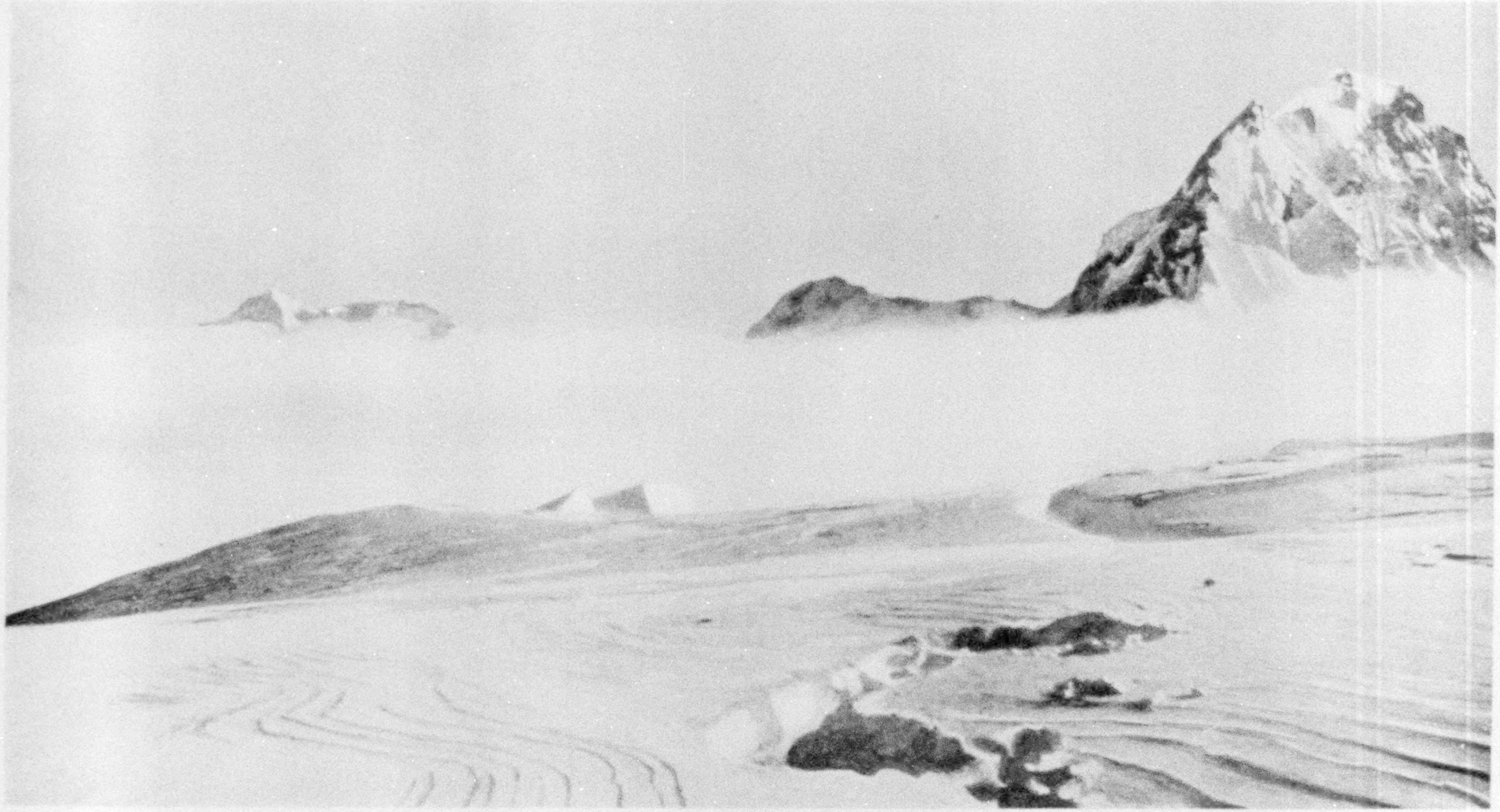
Between June 11 and 13 we transported the remaining supplies from the caches on King Glacier up to the col and took one small load to a point 1,200 feet above.

The last rope left camp on the King col at 7:15 a. m. on the clear and promising morning of June 14. We had not gone far, however, before a storm broke upon us and we were enveloped in blinding snow.

Progress was slow. At one point we made only a few hundred feet in 40 minutes. At last, however, we cleared the "Avenue of Blocks"—so called because of the colossal masses of ice which flanked us—and at 6:15 p. m. we made camp on the open plateau at 15,600 feet. This we named Ice Cliff Camp (see page 617).

We were well content with the day's progress, since we had succeeded in bringing to this point three tents and sufficient provisions for four days. We were keen to continue the advance, but the weather made this impossible.

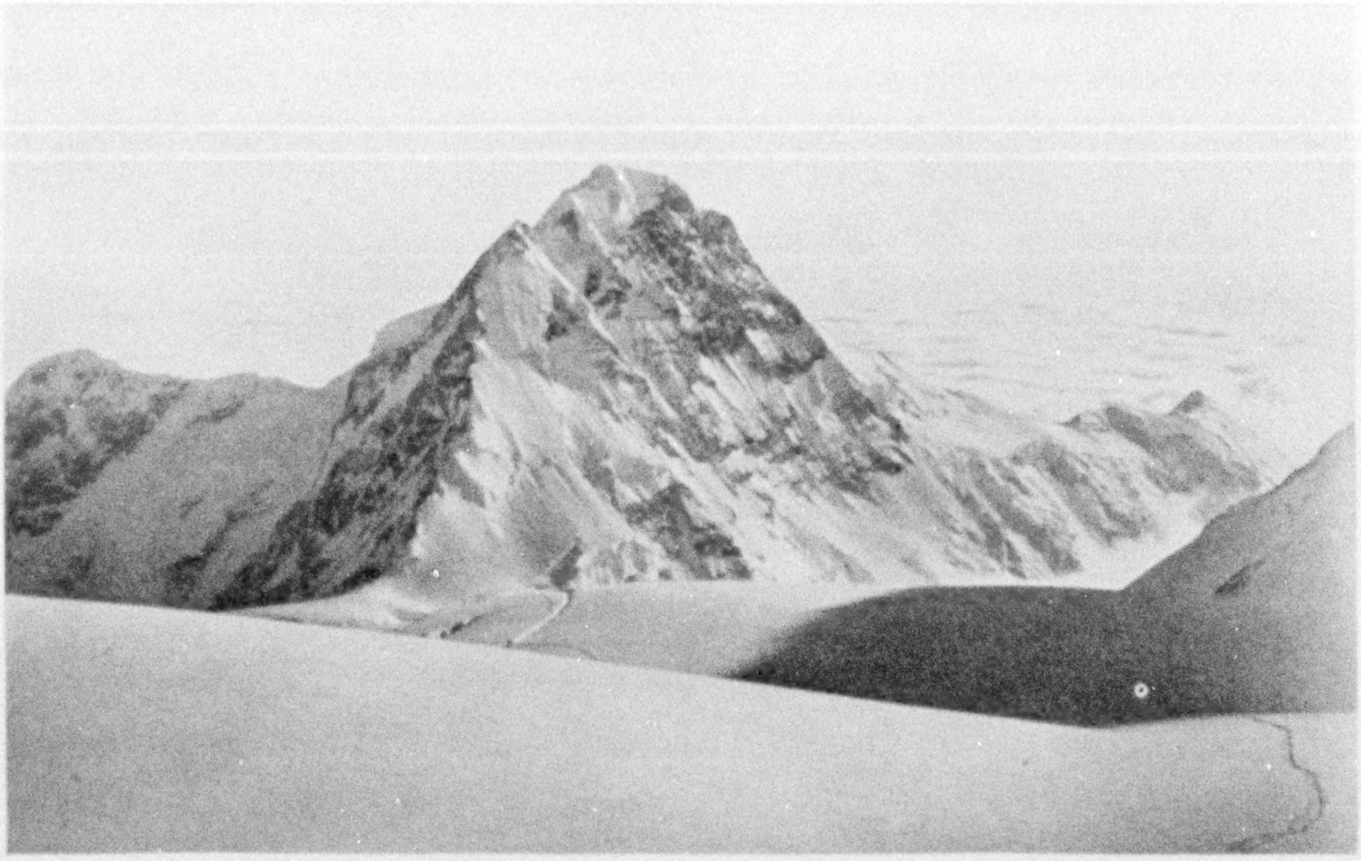
At 8 a. m. June 16, with the thermometer at three degrees below zero, we began a general advance and made steady progress till noon, when a dense fog suddenly enveloped us. Farther advance would have been out of the question if the reconnaissance party had not, with amazing accuracy, picked out a route through



Photograph by H. F. Lambart

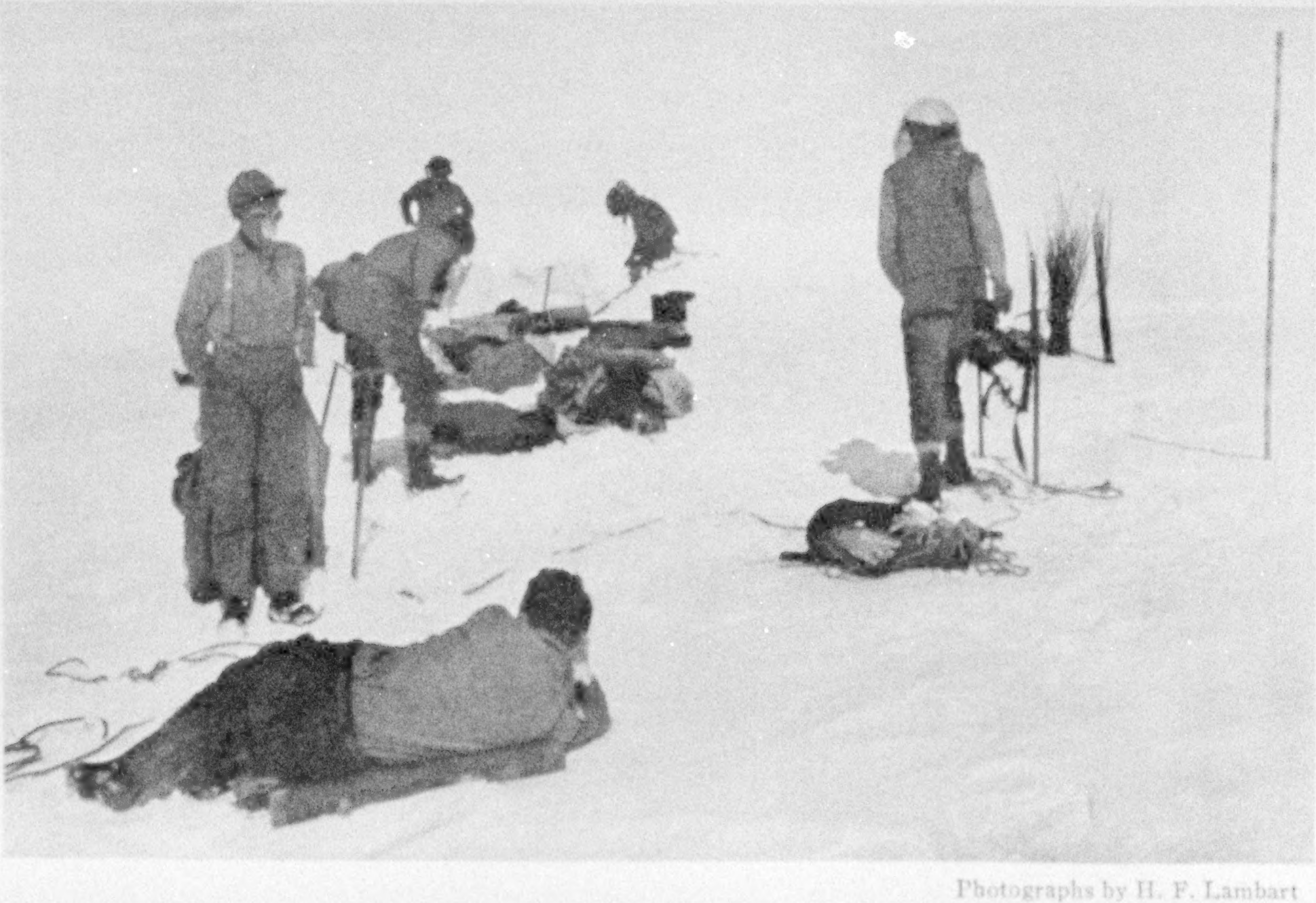
MOUNT ST. ELIAS (LEFT) AND KING PEAK PEER THROUGH THE MISTS

The former is 26 miles from Ice Cliff Camp (see text, page 616). Beyond the creviced surface of the foreground appear the tops of the great ice blocks through which lies the way to the King col below.



KING PEAK SURMOUNTS A SEA OF CLOUDS

The summit of this western subsidiary peak of the Canadian monarch, rising 17,130 feet, is not more than five miles from the camera. The long ridge leading to the right of the mountain is the southern wall of King Glacier. The King col, descending from the summit in a jagged arête, is just below the ridge facing the reader (see illustrations, pages 610-611).



Photographs by H. F. Lambart

PREPARING CAMPING GROUND AT KING COL (SEE TEXT, PAGE 613)

The weather here was bad for a few days, and the snow covered two-thirds of the 7-foot-high tents. In the right background are some of the willow wands used to mark the trail (see text, pages 618 and 626).

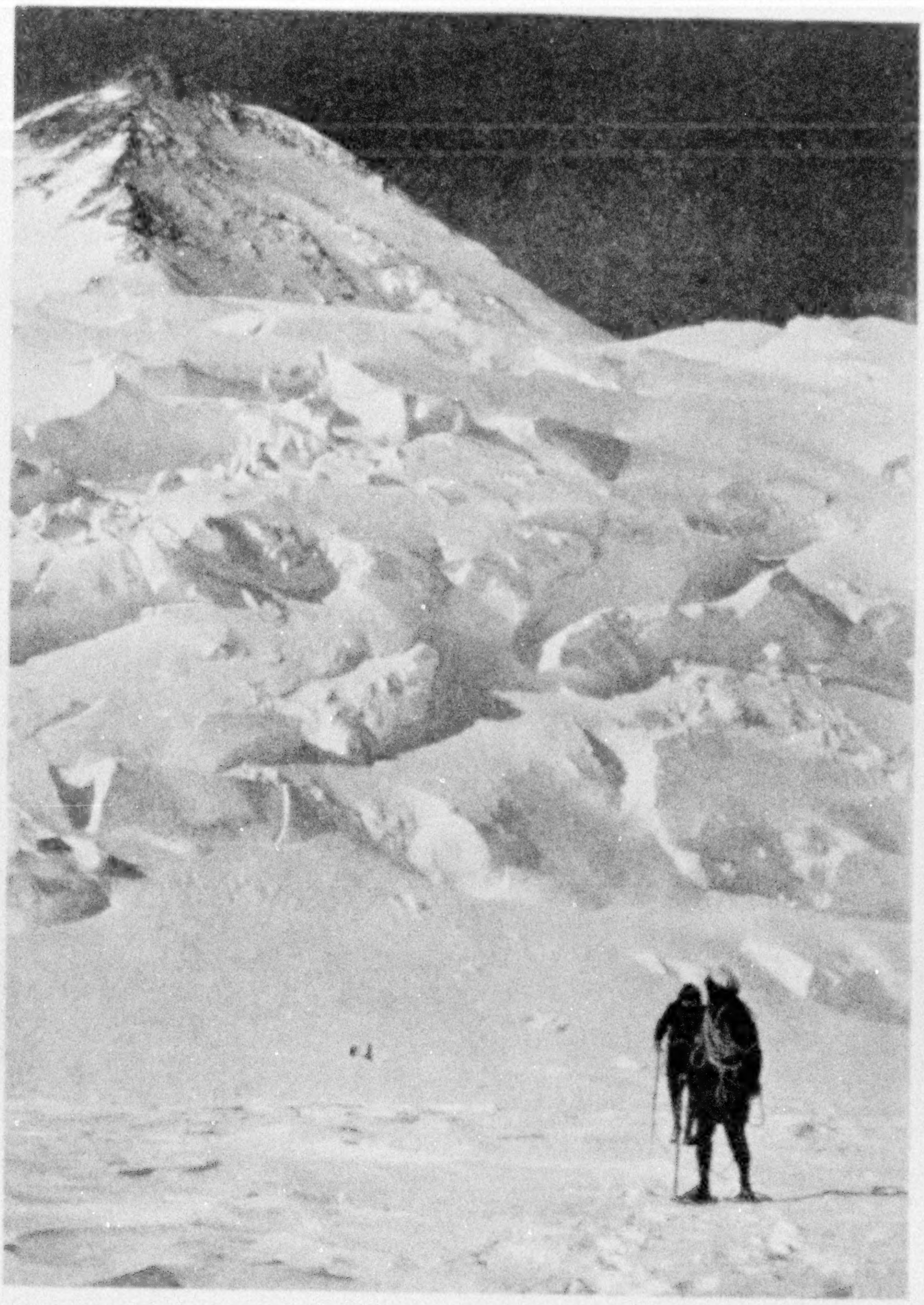
a chaos of ice blocks and across an immense crevasse.

At 6:30 we made camp at a spot to be known as Windy Camp (see page 627).

During the night the temperature dropped to 32 degrees below zero. At 3:30 a. m. we made ready to start, but did not get away until 9. The whole party succeeded in advancing to an elevation of 18,500 feet, where we hoped that at least a glimpse could be obtained of the whole top of the Logan massif.

After waiting for an hour, however, the return to Windy Camp was reluctantly made. That night (June 17-18) we experienced our lowest temperature—33 degrees below zero, Fahrenheit.

### ONE DAY'S PROVISIONS, 3,000 FEET TO GO



Photograph from H. F. Lambart

THE KING COL FROM THE EAST ARÊTE OF KING PEAK (SEE, ALSO, PAGES 620 AND 622)

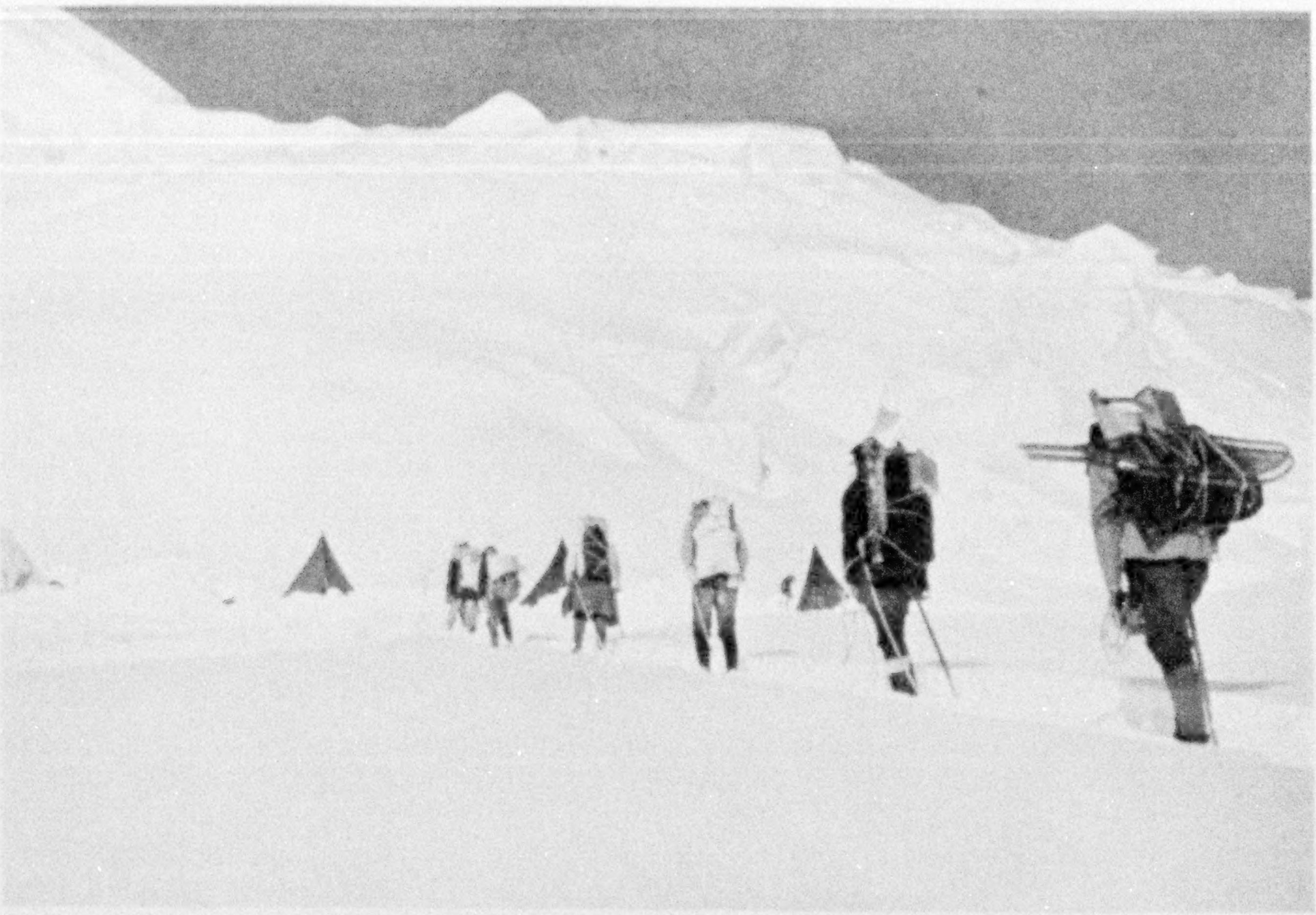
We were now encamped at an elevation of 16,700 feet, with but one day's provisions left (the bulk of our supplies being more than 2,000 feet below us), without an accurate knowledge of the position of the ultimate peak upon the summit of the massif or the conditions of the intervening northern slopes of the massif.

It was decided that the party should split, and while part brought up provisions from the lower camp at the King col, the rest should proceed to a point where the exact location of the summit of Logan could be determined as well as the nature of the intervening country.

Most of our plans were realized through the work of the day. The reconnaissance of the heights beyond 18,500 feet was made successfully, under the most severe weather conditions, and the members of the carrying party made their way back to King Col Camp, where they spent the night.

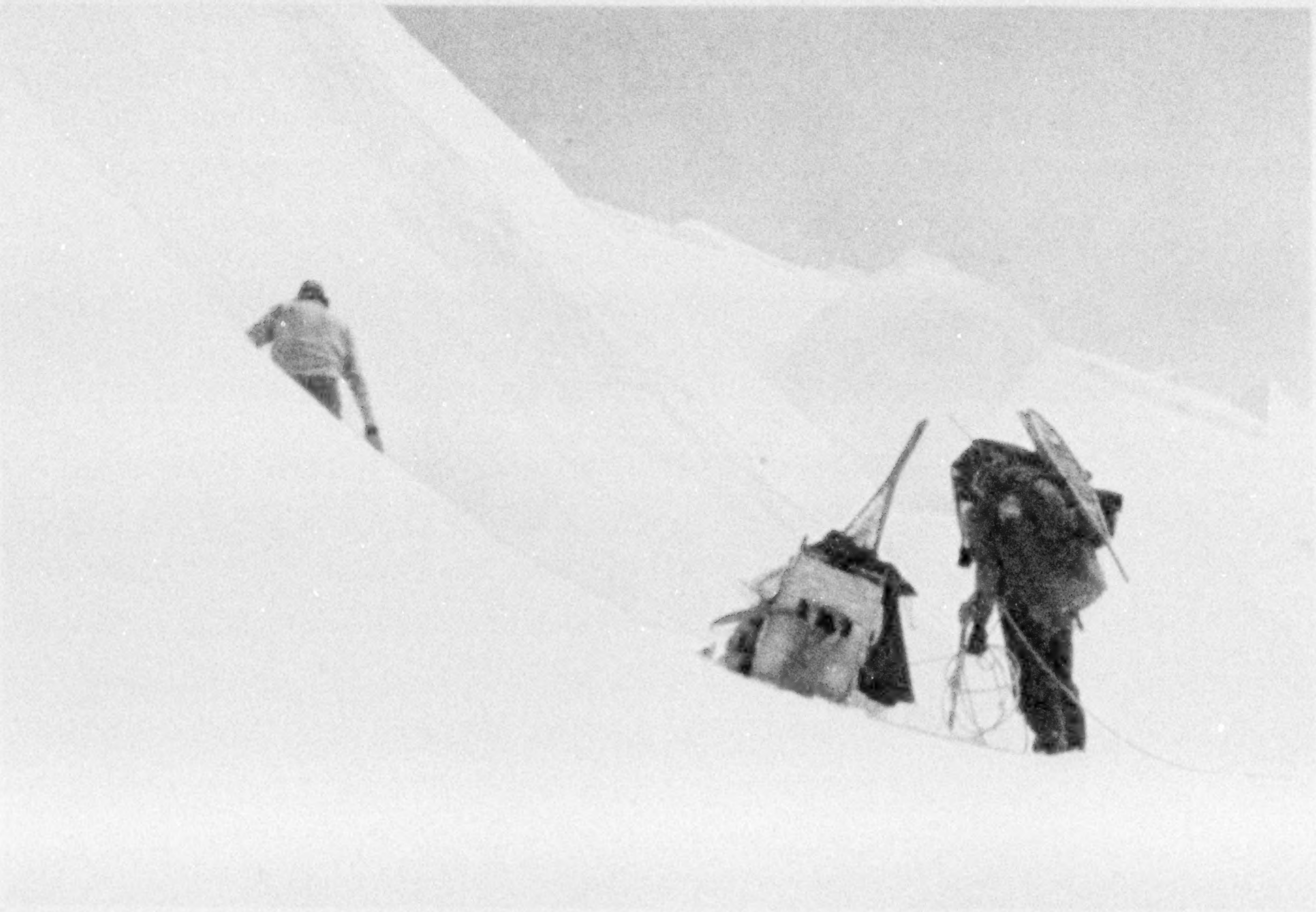
June 19 was a day of never-to-be-forgotten toil. Burdened to the limit of their strength, the carrying party labored through deep snow, and it was an immense relief when the reconnaissance party came down from Windy Camp to lend a hand.

Just beyond our old Ice Cliff Camp the storm reached the height of its fury. Blinded by the driving snow, every step an agony by reason of the depth of the drifts and the labor of drawing breath at that altitude, we struggled on, and at



BACK-PACKING INTO THE KING COL

The col, or saddle, marks the head of King Glacier. Instead of connecting with the heights above, however, it brought the members of the Expedition up abruptly at the foot of a tremendous face of ice and snow.



Photographs from H. F. Lambart

AMONG THE ICE CATARACTS OF THE LOGAN MASSIF

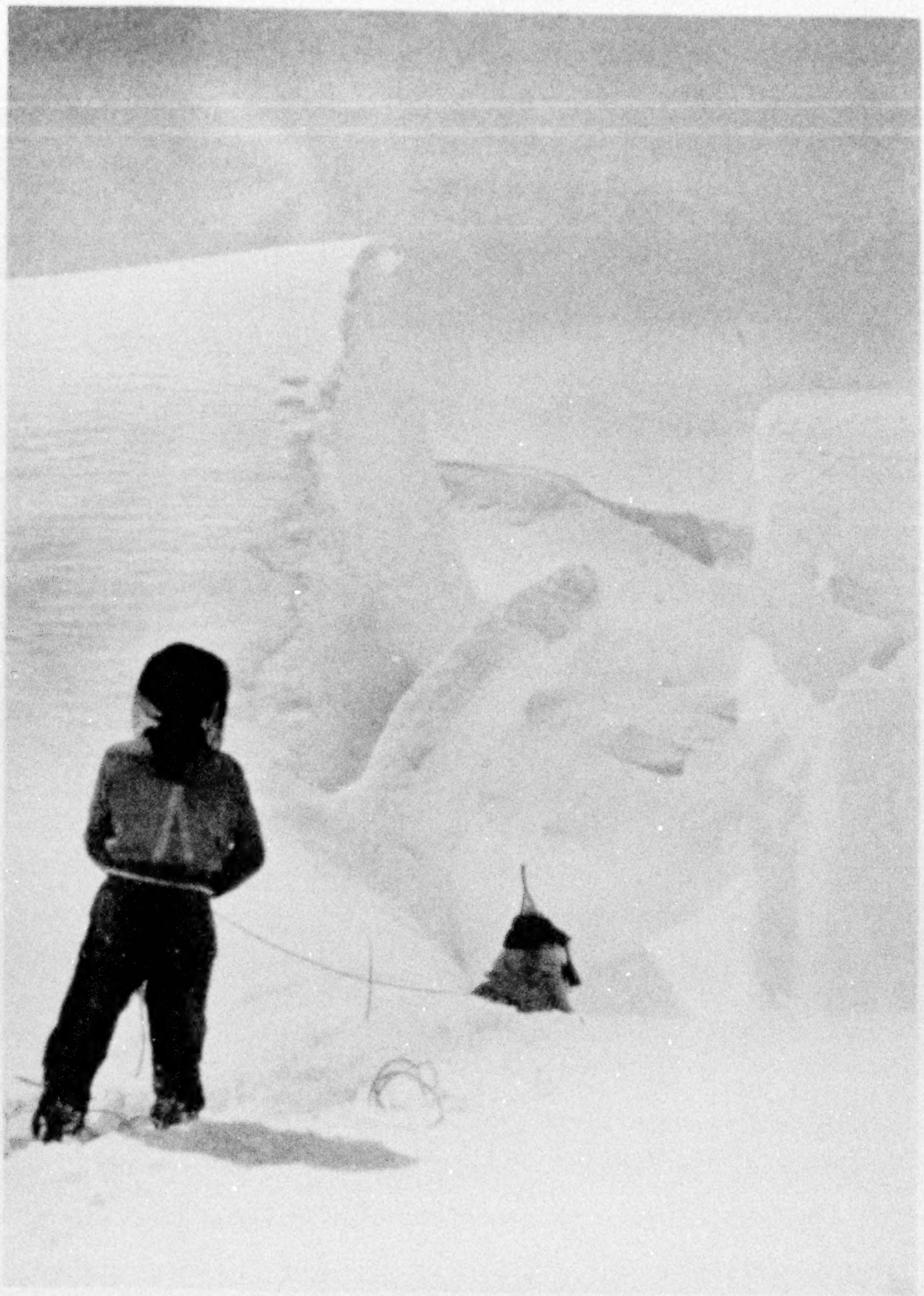
The climbers are entering MacCarthy's Gap and have substituted crampons for snowshoes.

9 o'clock in the evening reached Windy Camp.

There still remained the effort of digging out the camp, which was almost obliterated by the drifts; but at last it was done and night closed in on our exhausted party.

The morale of the climbers had been greatly heightened by the successful reconnaissance of the previous day. At 2:30 in the afternoon we continued our advance with supplies, reached our 18.5 Camp—a little saddle in the upper group of peaks, where our feet touched open rock for the first time since leaving Quartz Ridge—and returned under a leaden sky, in the dim mountain twilight, to Windy Camp.

Most of the next morning the party slept gloriously while the storm raged with unabated fury, but at 3 p. m. the sun suddenly came out and the wind died away, leaving a world of dazzling white. An immediate advance was resolved upon and we moved off on snowshoes. We reached 18.5 Camp at 9:30, set up our tents, and, after a wonderful meal prepared by the indefatigable Andy, we crawled into our bed rolls for a night of warm rest.



Photograph from H. F. Lambart

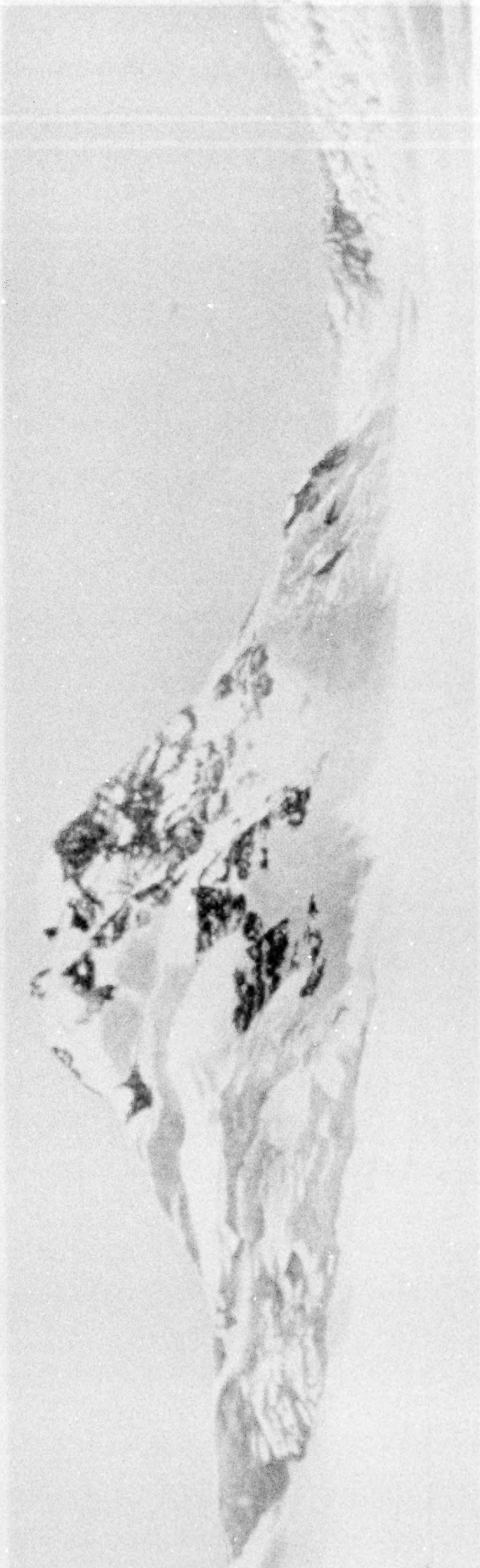
NEGOTIATING MAC CARTHY'S GAP THROUGH THE ICE BARRIER

When the Expedition's advance was blocked by a face of ice and snow at the King col (see, also, page 619), a reconnaissance party ascended the eastern arête of King Peak and discovered MacCarthy's Gap, a bridge of snow over an ice chasm (see text, page 616, and illustration, page 620), which led to the upper plateaus.

### THE HIGHEST CAMP EVER PITCHED ON NORTH AMERICA

At this our highest camp, and we believe the highest point at which a camp has ever been pitched on this continent, we recorded a minimum temperature of 17.5 degrees below zero; yet in the late afternoon, with the bright sun overhead, the thermometer had stood at 5 degrees above. These sudden variations in temperature were extremely trying, for by this time we were all feeling the altitude greatly. Our respiration was labored and our movements were slow to distraction.

It was almost noon before we resumed our advance, with eight days' provisions and our camp equipment. The day was short and we battled against snow and wind in traversing the northern slopes of the mountain in an easterly direction, encircling a great basin of snow and advancing hardly more than four miles.



Photograph by H. F. Lambart

PREPARING A CAMPING SPOT IN THE SNOWS OF THE KING COL

King Col may be seen to the extreme left and King Peak in the center. Over King Glacier, skirting the peak's northern slopes, the Expedition made its way to the 14,500-foot level (see photograph, page 611).

We entered our new camp about 5 o'clock, and with less labor than the night before our two tents were pitched on the outskirts of a vast plateau of snow which sloped gently toward the north.

June 23 broke in storm, but at 8 o'clock we were awakened by MacCarthy's cheery voice outside saying that it looked as if this were to be "the day." With a bright sun and the thermometer at 15 degrees above—it was 15 below during the night—we made careful preparations for the journey into unknown territory, for the summit was hidden from view.

### READY FOR THE FINAL DASH

Well provided with emergency rations, extra clothing, our cameras, and aneroid barometer, we set out at 11 o'clock.

We moved around the margin of a great basin of snow, and then, dropping slowly to a lower level, climbed to the summit of a long, projecting north shoulder of our "double peak," which rose now some 1,500 feet above us. We had lunch, resting in the snow beside the trail, and, as the view was still quite obscured toward the east, we decided to climb the summit directly above.

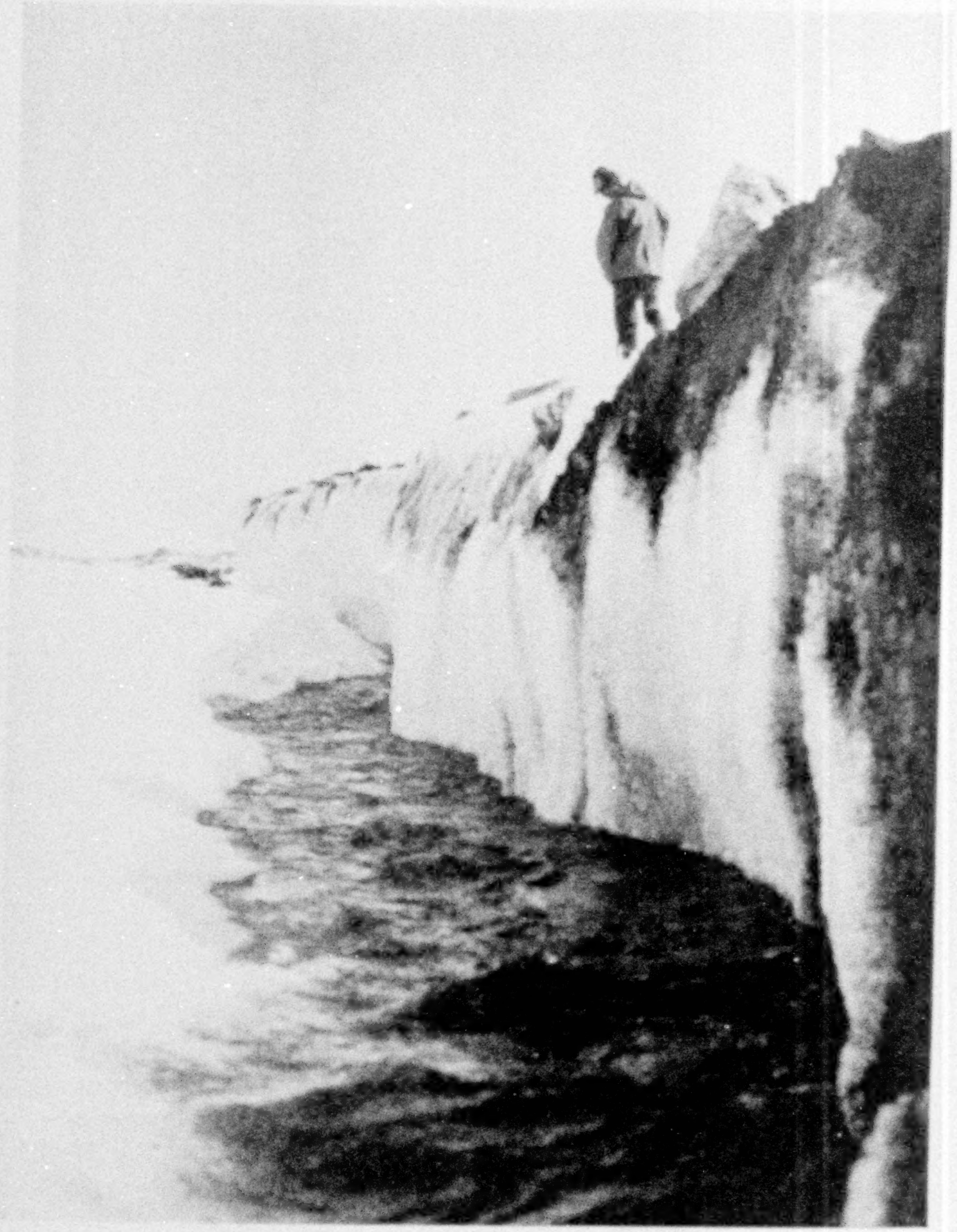
Having changed from snowshoes into crampons, we made this summit by 4:30 in the afternoon and were confronted with a new situation. Before us now, in plain view, lay the whole eastern end of the massif of Mount Logan, and at a distance of two and a half or three miles across an intervening depression 1,000 feet below rose, only slightly above our present position, the true summit!

The whole of the Seward Glacier, at our feet, and the St. Elias Range were in full view; but we were so occupied with our main problem that we gave little attention to scenery. With hardly a minute's delay, we began the descent of the intervening slope. The peak of Logan lay straight ahead.

At the bottom of the depression between the two peaks we rested on the rocks, dangling our feet over the edge of the steep slopes, which dropped away toward the south to the surface of the Seward Glacier, thousands of feet below. We nibbled at our "iron rations" disinterestedly, anxious only to have enough strength to conquer the summit, which

Photograph by Norman H. Read

AMONG THE ICE BLOCKS ON THE LOWER FACE OF MOUNT LOGAN



Photograph by Henry S. Hall, Jr.

A STREAM ON THE SURFACE OF LOGAN GLACIER

Photograph by Henry S. Hall, Jr.

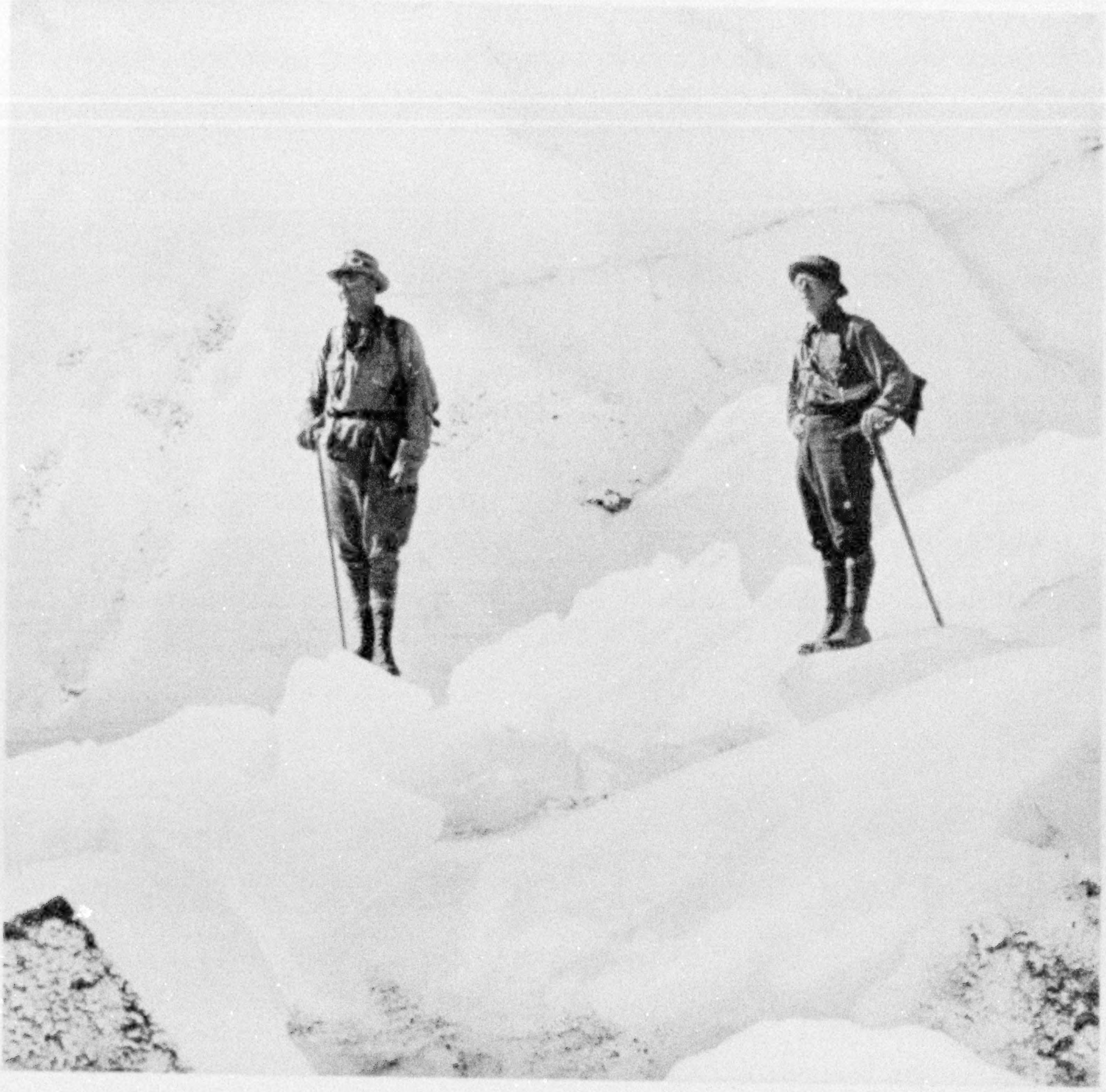
SHIFTING PACKS

The bundles of willow wands later saved the party from perishing.

Photograph by H. F. Lambart

A LUNCHEON PARTY ON THE KING GLACIER ICE FIELDS

The men have halted at the summit of the Ice Dome, an intermediate point of carry between Quartz Ridge and Observation Camp Site.



Photograph from H. F. Pollard

SURVEYING A WORLD OF ICE AND SNOW

Albert H. MacCarthy, leader of the Expedition, in the rear, and H. F. Lambart, deputy leader, in front.

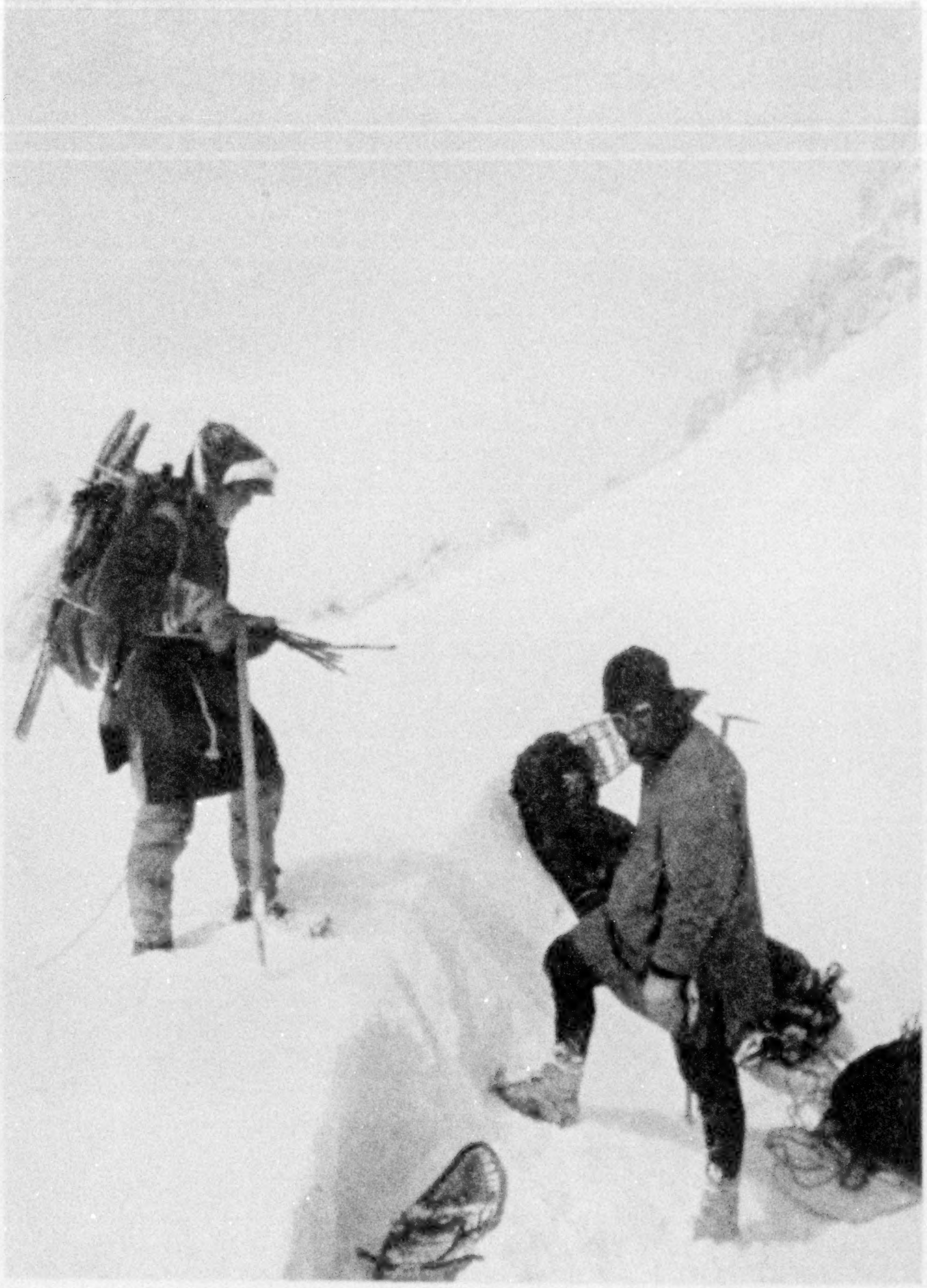
seemed so very close and which under normal conditions of atmosphere and full strength would have been mere child's play to ascend.

Snowshoes and all unnecessary weights were now cached and we began the slow grind up the gentle slopes, which soon gave place to a steep, triangular icy slope running back to the apex. This stretch is of the hardest flinty ice, carved into the most fantastic forms by the incessant winds. These irregularities, however, added materially to the ease with which the ice was climbed.

MacCarthy, who was leading and making use of every scrap of natural foothold, wove back and forth and finally stepped out upon an easterly arête, which was less steep. We now made good progress, but lost a little ground in descending into a small hollow from which rose steeply another sharp arête leading to the final summit.

### ATOP THE HIGHEST PEAK IN CANADA

With a strange feeling of unconcern, almost of unreality, we came to the culmination of all our months of planning and weeks of labor and stepped out on to the small, triangular summit, the highest point in the Dominion of Canada, and the second highest on the continent. The



Photograph from H. F. Lambart

A HALT NEAR 18.5, THE HIGHEST CAMP PITCHED BY THE EXPEDITION (SEE, ALSO, TEXT, PAGES 621 AND 629)

The Arctic cold and arduous labor of the climb necessitated the best woolen clothing, "shoe-pac" or "barker" boots (rubber soles with leather uppers), or dry-tanned moccasins, wind-proof outer gloves to slip over woolen gloves, drill-cloth parka, woolen helmets, snow glasses and frequently stained mosquito nets to wear over the head as protection from sun and wind.

sides of the peak were bulging and the top appeared as a huge acorn, below which cliffs descended for thousands of feet to the Seward Glacier.

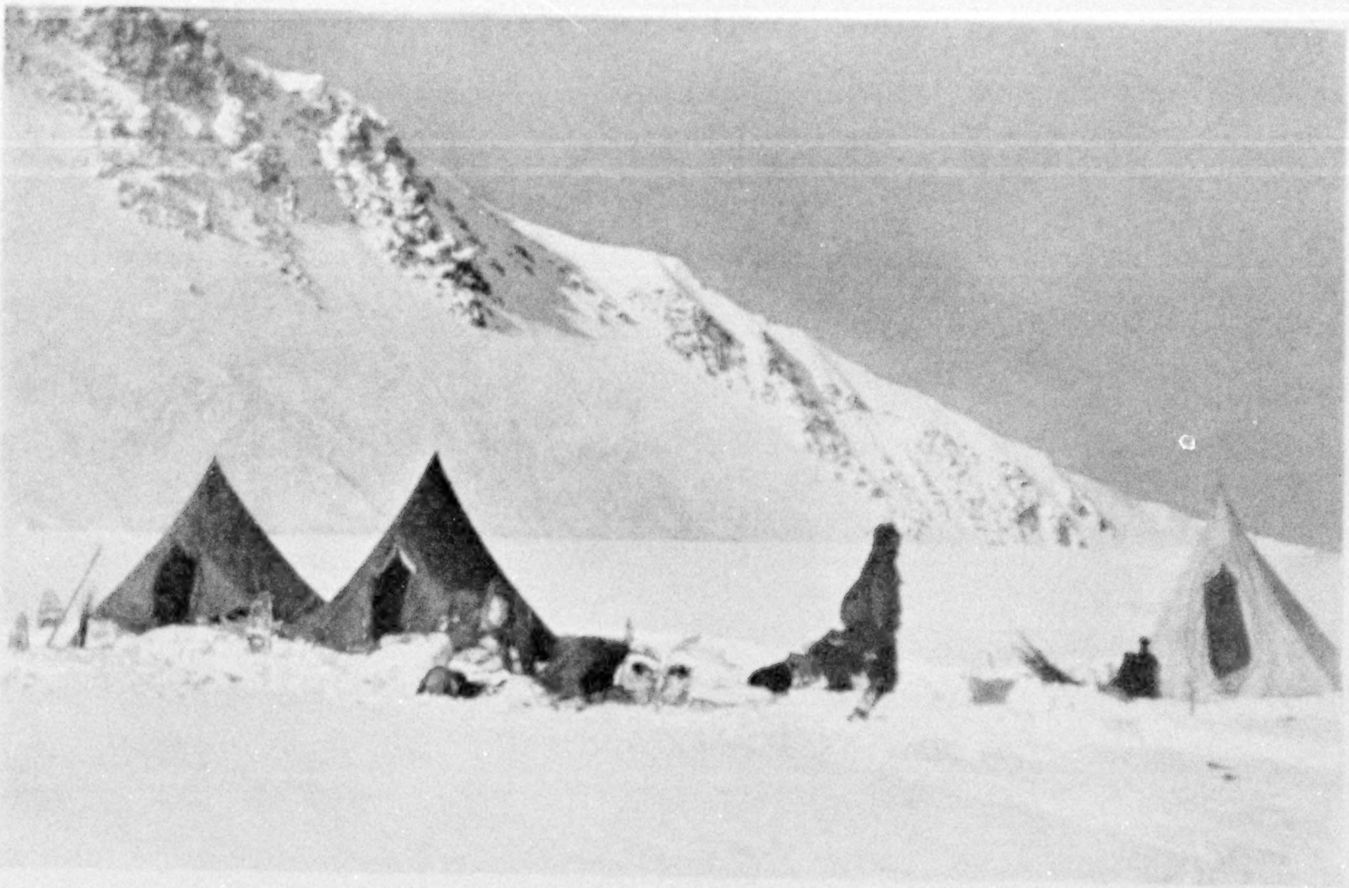
On reaching the summit we encountered that strange apparition known as "the specter of the Brocken," the weird phenomenon seen on the tops of very high mountains, under certain conditions of light and atmosphere, whereby the figure of each observer is seen silhouetted against the fog banks in the center of a complete circular rainbow of miniature size.

We set foot on the summit of Mount Logan at 8 o'clock in the evening, and as we stood in a little knot, with the view completely obscured, we were reminded by Andy Taylor that a storm was upon us. So, after reading the aneroid and a hearty handshake all around, Carpe deposited a small brass tube containing our record. Our thermometer, which was exposed for a short time only and which was observed to be rapidly dropping, read 4 degrees below zero, Fahrenheit.

We began our downward journey after a stay of barely 25 minutes at the summit, retracing our steps down the steep arête and along the icy slopes at accelerated speed.

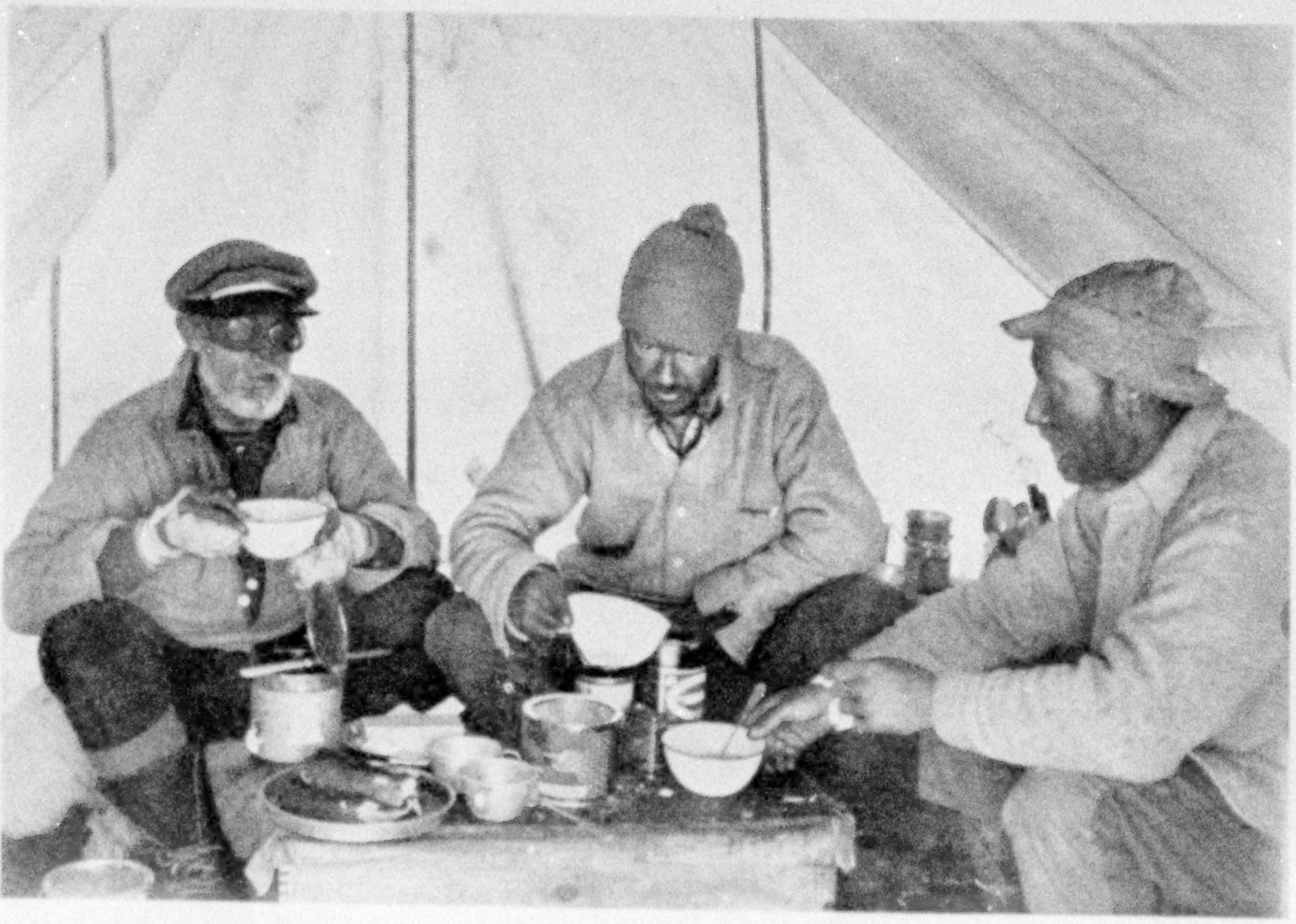
We arrived at our cache of snowshoes without mishap, but the storm by now was full upon us.

We had come to the end of our willow wands (see text, page 611) before reaching the summit of the first peak, early in the afternoon, and now we groped along, guided only by the general slope of the ground. After stumbling forward for an hour in a fruitless effort to locate the trail, the hopelessness of the task was realized. We halted on the side of a fairly steep snowdrift and bivouacked for the night, digging in as best we could with the aid of our snowshoes. As nearly as we could judge, our elevation here was about 19,000 feet.



WINDY CAMP, 16,700 FEET ABOVE THE SEA

Back of the tents are the granite cliffs of the Logan massif (see text, page 619)



Photographs by H. F. Lambart

THE FESTAL BOARD AT CASCADES CAMP

Truly "festal," for after the conquest of Canada's highest peak the Expedition celebrated their feat "by dining upon almost every conceivable delicacy that the genius of man has contrived to put in a can" (see text, page 631).

Photograph by Norman H. Read

NEAR THE 18.5 CAMP—ELEVATION, 18,500 FEET

The exhausted party is resting in the shelter of the granite cliffs immediately after fighting a blizzard (see text below). Left to right, A. M. Taylor, W. W. Foster, Allen Carpe, H. F. Lambart, reading the aneroid, and Albert H. MacCarthy bending over to remove his load.

Our shelters were miserable affairs, but we managed to make them roomy enough to get everything except our legs under the protecting overhang. Here we rested fitfully during the interminable night and into the late morning of the following day. The party was in deplorable condition, for all were suffering more or less from frozen fingers and the effects of snow blindness, while one member, due to tight socks, had the toes on both feet frozen while he slept. Before the loss of our maximum and minimum thermometer here, we read 12 degrees below zero.

### A WILLOW WAND LEADS TO SAFETY

Up to noon of the 24th conditions had not changed. Should we hazard another night in the open or strike out into the snow and fog, hoping against hope that just one little guiding twig might show itself? We decided to take the latter chance.

Changing our direction now half left and climbing on a heavier slope, we came suddenly upon a willow wand sticking out of the snow. It appeared to us like a telegraph pole!

Our joy was unbounded, for this discovery meant a sudden change from a situation in which bewildered climbers were fighting for their lives in fog and storm to one of almost certain security, leading back to shelter, food, and rest.

Our pace was quickened, as we followed from twig to twig, not daring to allow the last man on the rope to leave the rear twig until the one forward had been found.

Some members of the expedition during these latter experiences had certain hallucinations. At one moment the ground would appear to drop away in front, and, expecting a descent, we would instead experience a sharp rise; then, again, a wall of snow would seem to appear to one side, and upon stretching out a hand one found nothing at all; and yet again, a wild procession of fences, barns, and houses seemed to be following our trail on either side. It is difficult to account for all this, except that we were nearly spent,

Photograph from H. F. Lambart

DRESSING FROZEN FINGERS FOLLOWING THE ORDEAL OF THE ASCENT

A two-day rest at Cascades Camp was spent in nursing frozen hands, faces, and feet and in eating unrestrainedly (see page 627). Only one man suffered no ill effects from the cold. The return trip was made less painful by abandoning at this camp all effects which could not be carried in one pack.

and in our exhausted state our minds undoubtedly wandered.

The 25th was a glorious day of rest. On the 26th we decided upon a desperate effort to get off the mountain and reach our camp at the King col. Of this day of blizzards volumes could be written.

The willow wands kept us to the trail, and all went well where the footing was good and the snowshoes could be used; but the time soon came when we had to rise more abruptly to get through the rocky gorge—the site of our 18.5 Camp—and here the surface became glare ice and it was impossible to keep one's feet.

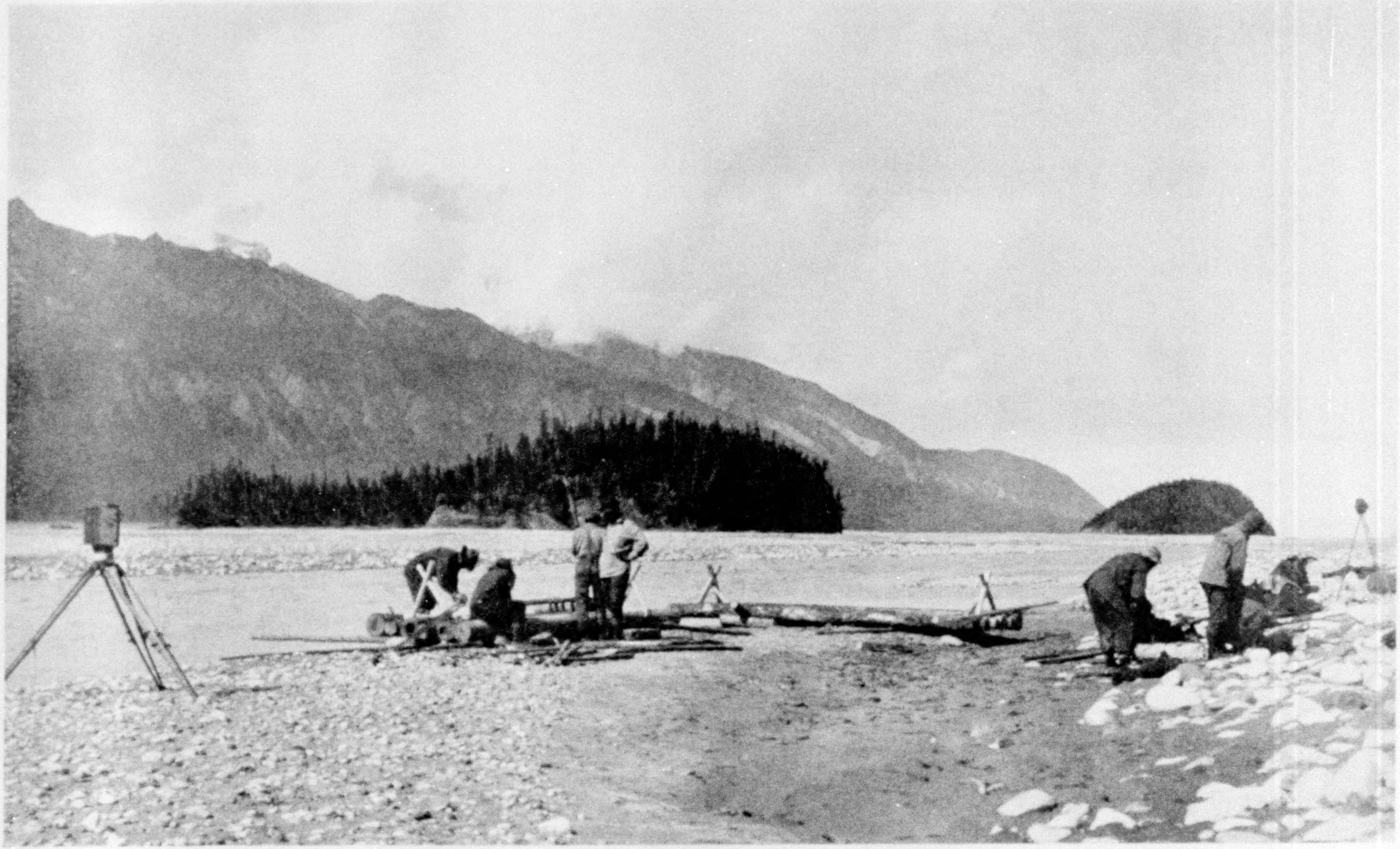
### LONG ICICLES HANG FROM BEARDS

Snowshoes had to be taken off and crampons substituted. With frostbitten hands and feet, this task simply could not be accomplished by some of the members of the party; so to our injuries were added a few more frostbitten fingers. One rope was a little in advance and above the other, and, looking down, I could see MacCarthy, Carpe, and Foster struggling on, so disfigured with ice as to be quite unrecognizable. From their beards and helmets protruded long icicles, tinged red in one case from sore and bleeding lips. They looked like huge pelicans beating against the storm.

Thanks to the efforts of the stronger members of the party, all arrived, after what seemed hours, in the shelter of the granite crags flanking the 18.5 summit.

After a short rest, we moved down the southern slope of the mountain, and, although dealing here in some measure with heavy wind and driving snow, we had left behind us the severest storm area. Upon reaching deep snow we disposed of the crampons.

At the Windy Camp site all was completely buried in snow, and we stayed here only long enough to dig out a few personal effects, leaving the rest behind. On the slopes immediately above the site of Ice Cliff Camp the snow was so deep that we floundered along in a very



Photograph by H. F. Lambart

BUILDING RAFTS FOR A 60-MILE TRIP DOWN THE TURBULENT CHITINA

At Hubrick's Camp (see text, page 631) material and tools had been left to build two boats to carry the Expedition down the Chitina River; but the exhausted men could not undertake this labor and finally decided upon two rafts of logs. These were built in two days, and the swift Chitina gave the party a violent, exciting run.

disorderly manner. Then came hours of toil, wallowing through deep drifts that had accumulated among great blocks of ice. Changing from snowshoe to crampon time and time again during the night was wearisome work, but steady, sustained effort brought us on, and we finally passed safely through the crevassed ice cliffs and MacCarthy Gap.

The sight of the three tents still standing away below us on the King col brought a solace that one cannot describe.

June 27 was a day of complete rest, during which Colonel Foster's efficient clinic gave relief to frozen parts.

Our way now lay straight down the King Glacier, and, with a good surface upon the snow, we reached the sledge which we had left at the base of the King icefall. After some digging we got it out, and for the first time in many days we moved forward with free backs. At Observation Camp we tunneled for some few articles left behind and pressed on.

A mile farther down, coming to the ice dome, our first stop above Quartz Ridge, we abandoned the sledge, with many articles that it had been supposed might be useful and even indispensable for the journey out, and again submitted to the toil of back packing.

### LUXURIOUS CAMP WRECKED BY ICE

From the summit of Quartz Ridge we saw the tents of Cascades Camp 1,000 feet below, and after two hours of struggle through deep, soft snow we came to the wreckage of what was a month before our luxurious base camp. The whole surface of the ice had dropped several feet, leaving the tents and their contents precariously perched upon ice pillars.

One big tent was repitched, and in the early hours of the next morning we finally had the camp in order and had consumed astonishing quantities of food.

As we were now actually "off" the mountain and permitted ourselves to relax, we became more conscious of the strain we had been under. We were not lulled to sleep by any false sense that all was over, however, as 138 miles still separated us from the railway at McCarthy.

Two blessed days of rest passed in this camp. Here we celebrated the conquest of Mount Logan by dining largely upon almost every conceivable delicacy that the genius of man has contrived to put in a can, and by sleeping at great length (see page 627).

We started on our long homeward trek across the glaciers on July 1.

On July 4 we crossed over to the Baldwin-Fraser cache, where our feet once more touched *terra firma*, after 44 days on the ice. The ecstasy of being once more amid green shrubbery and of feeling the soft turf underfoot can hardly be understood except by those who have had a similar experience.

At this camp we found that a bear had successfully solved the problem of a bear-proof cache and had made away with most of our store of provisions; so perforce we had a slim meal.

### EXHAUSTED EXPLORERS BUILD RAFTS

At Hubrick's Camp material and tools had been left for the purpose of whipsawing lumber and building two boats to take us down the swift stream of the Chitina River. But with only one or two members of our party in fit condition to undertake such work, it was finally decided to abandon any idea of the boats and instead to trust ourselves to the mercies of two rafts, five logs in width and 16 feet long. The dunnage was lashed on an elevated rack in the center, and the rafts were ready to take the water on the 11th (see page 630).

With some few forced stops, when we grounded violently on the gravel bars, the exciting run of the swift waters continued the whole afternoon.

The Alaskan glacial stream is a power to be dealt with in no trifling manner. It is quite unlike other streams. Excessively cold and carrying in suspension great quantities of silt, the water has a decidedly thick appearance and, in the case of the Chitina River, careers down the wide, open valley at six miles per hour in treacherous, constantly changing channels.

On July 12 we set out on our long walk of 32 miles into McCarthy and arrived in high spirits at 1:30 the next morning.

Sailing from Cordova on July 22, we left behind us the bleak shores of Alaska and turned our faces to the south—and home.

# THE BEAUTY OF THE BAVARIAN ALPS

## By Colonel Fitzhugh Lee Minnigerode

THE Versailles treaty-makers stripped Germany of much of her territory and much of her pride. They trimmed her horizontal dimensions north, east, south, and west; but they did not lessen her height, for the highest peaks that were ever included within the old empire—her rugged Alps, her eternal snows—are still her own.

The Bavarian Alps have been less press-agented, less talked about, and therefore less visited by foreigners, than any other section of the mountainous country of Central Europe.

Switzerland holds out her arms in welcome to the visitor. No passport visés are required, customs regulations are slurred over, and the traveler is made to feel at home immediately. The Italian Alps and Northern lakes run Switzerland a close second in being advertised and therefore visited by outsiders.

On the other hand, Bavaria until very recently threw many difficulties in the path of the foreign visitor.

Happily, most of these irksome restrictions are now things of the past; but even so, the Bavarian Alps seem more remote, more inaccessible, than the mountain districts of the neighbor states. This is due, of course, to the fact that we read and hear less of them.

### EVERY VILLAGE IS A DELIGHT TO THE EYE

In Bavaria I have drifted leisurely from place to place, have taken the unbeaten track, lived in clean little *pensions* at the foot of some rugged pile, preferred the slow-moving coach to the swifter motor-car, and whenever and wherever the appeal came to me sufficiently strong—which was often the case—have unpacked and settled down to remain as long as I wished or as long as the spell of the surrounding beauty held me.

Sometimes I am fully aware that this impulse to stay on is not due entirely to the natural wonders. I know that the little villages, with the exterior walls of their houses painted in many colors and almost invariably adorned with scenes from Biblical history or legends of the country, shrines built into these walls, window sills gay with flowers, outside in summer and inside in winter, crucifixes at every turn in the village street, or perched here and there in the fields or along the unfrequented roadsides, have added charm to the jagged skyline that hems them in (see Color Plates IV, IX, XIII, and XIV).

On cloudy days, when the mountains are entirely obscured from view, there still remains a lure of street and dwelling that makes it a delight to walk around, discovering something new and interesting at every twist of the road. There is also a sure attractiveness about the native dress. It blends so perfectly with house and hill that mountains, woods, dwellings, and peasants seem each in perfect harmony, perfect liaison, with the other.

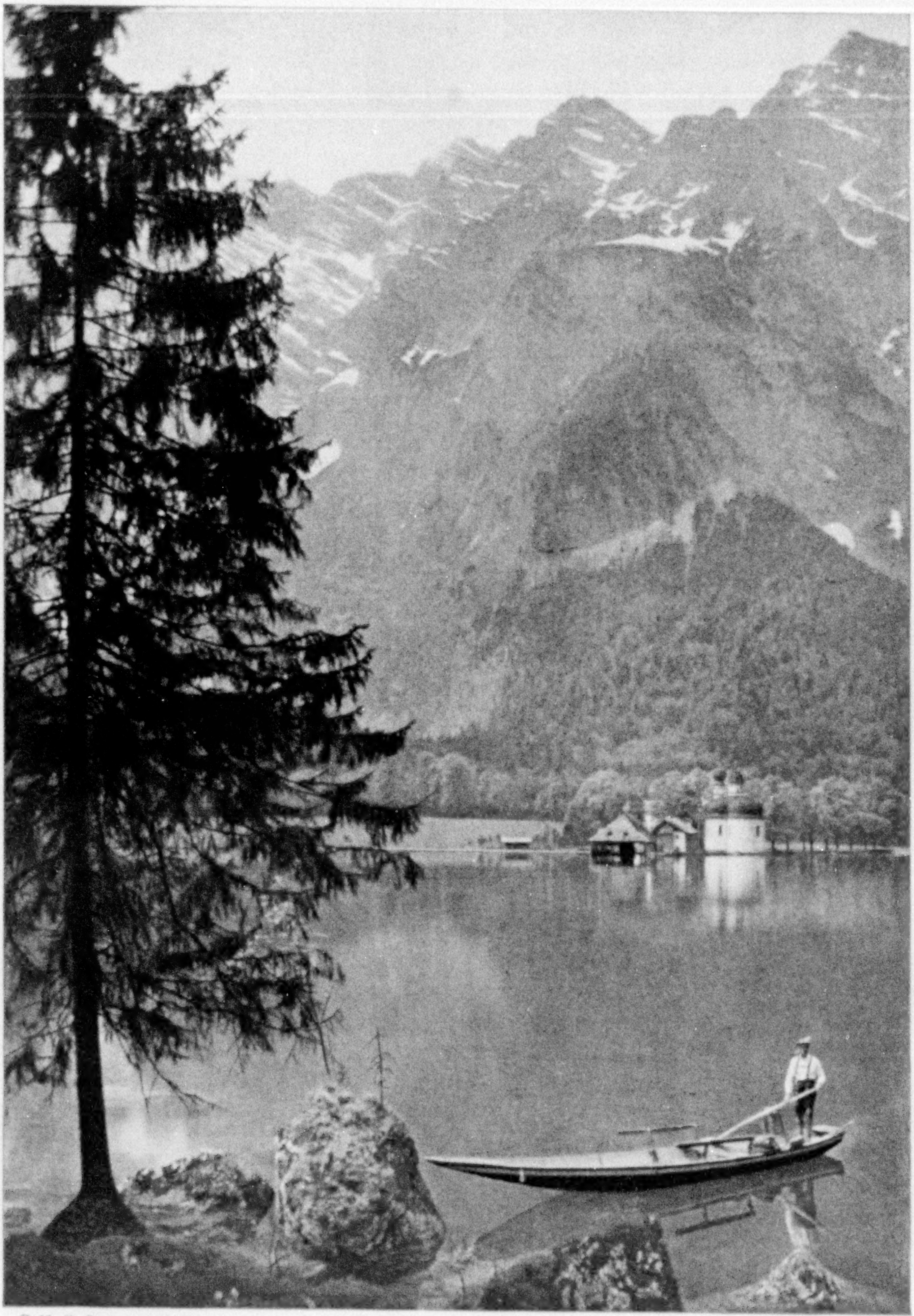
And yet again, there is such a clear-cut appreciation of art among all classes and all classes are so intelligent. Even the smallest villages have specialized in some line of endeavor that is truly artistic. Music, painting, etching, drama, wood-carving, pottery, sculpture, and photography—all the arts and crafts, in fact—have innumerable patrons and students.

Oberammergau has its marvelous Passion Play. In the years that intervene between the productions, the little village is not dead dramatically, for every soul of the 1,500 there has an opportunity to demonstrate his or her histrionic ability in the productions that are staged in the off years.

It is in this way that talent is produced which every decade astounds the world with the finished characterizations in many difficult rôles (see Color Plates III and IV).

But Oberammergau does not stand ahead—certainly not far ahead—of other Bavarian villages from the artistic standpoint, and the Passion Play is not its only pride. The wood-carvers and potters of Oberammergau are artists, not laborers. The school of wood-carving there is an art school in every sense.

Mittenwald is a town of less than a thousand inhabitants. With the exception



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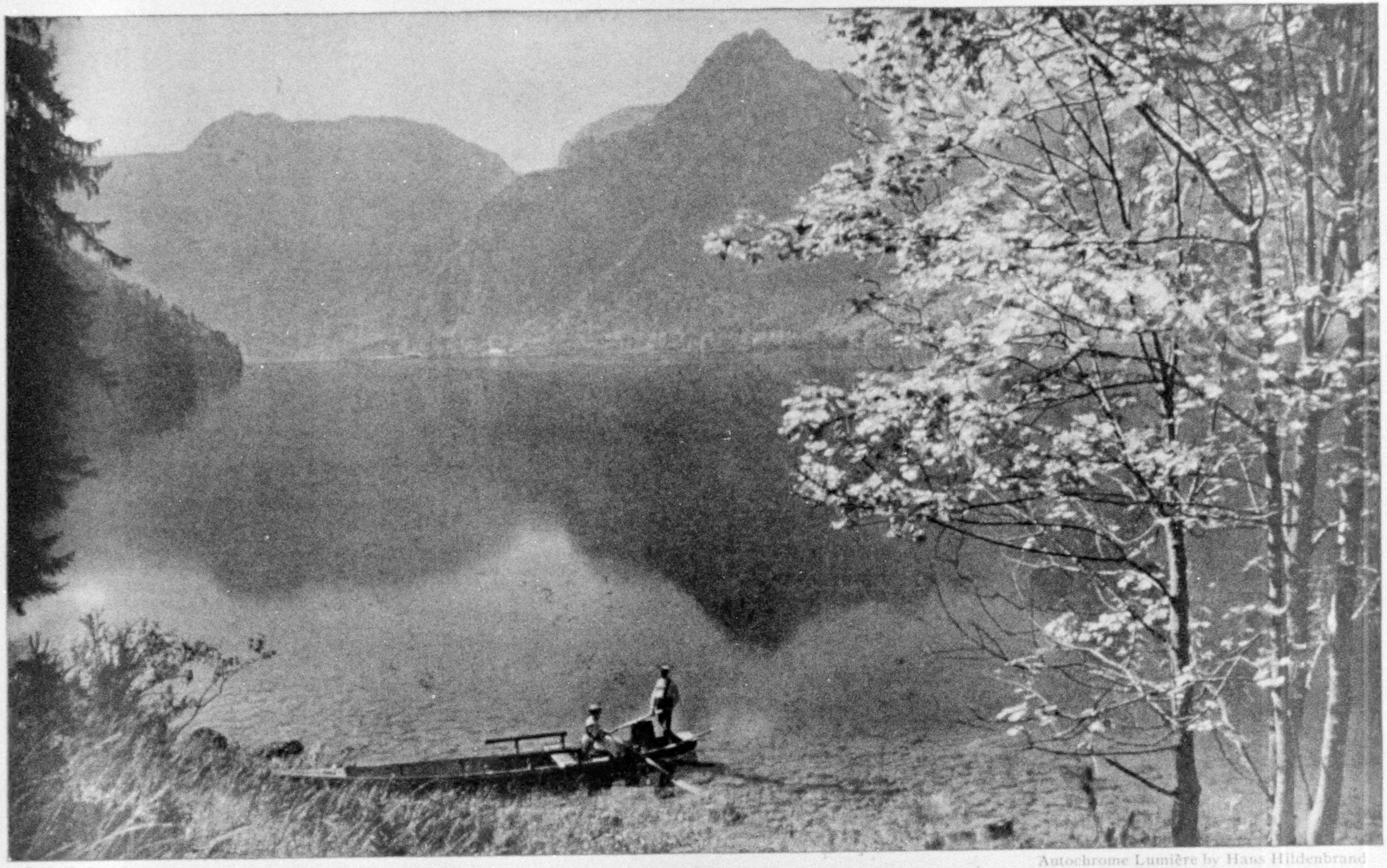
ST. BARTHOLOMÄ ON THE KÖNIGSSEE

Here, on a green promontory jutting out into this gemlike lake, are a hunting lodge and tiny chapel, the latter a place of pilgrimage during the festival of St. Bartholomew, when the surrounding heights are lit with bonfires.



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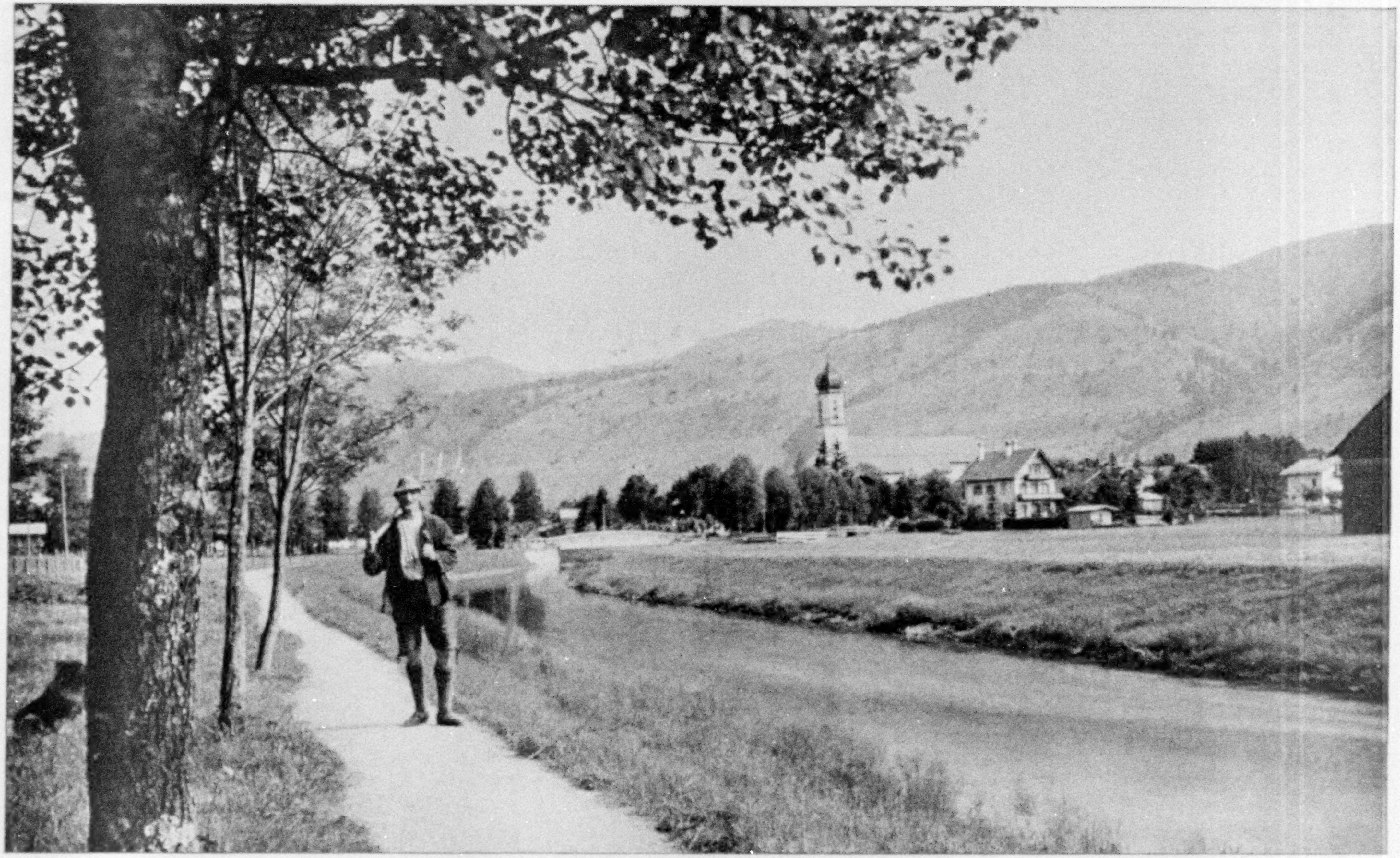
AUTUMN CROWNS THE KÖNIGSSEE WITH COLOR

Lofty mountains encircle this, the most beautiful of all lakes in the Bavarian Alps, which mirrors their peaks in its waters.



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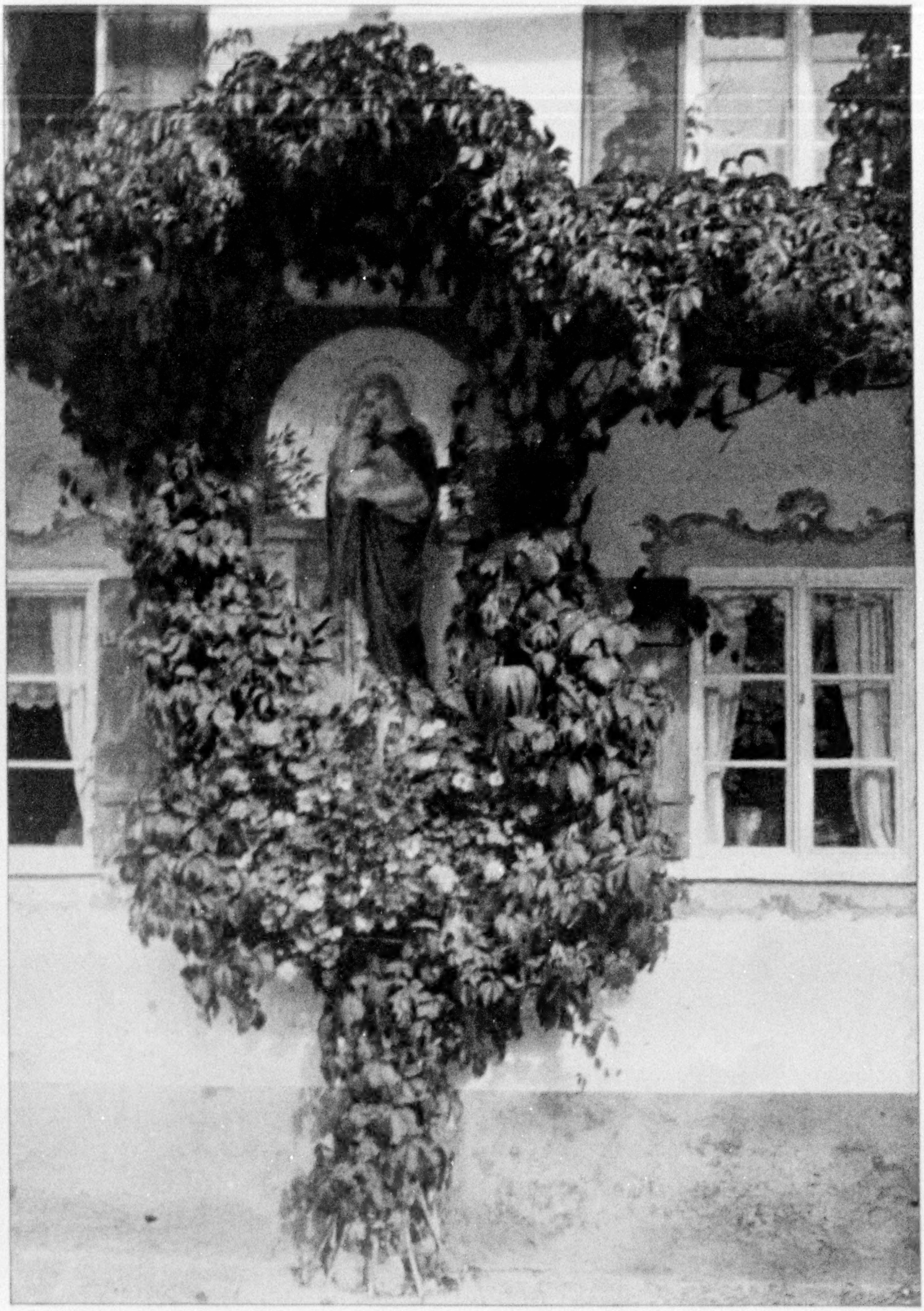
OBERAMMERGAU HAS KEPT FAITH FOR 300 YEARS

Pilgrim throngs flock to this Bavarian village every ten years to see that most impressive of dramatic spectacles, the Passion Play, enacted by peasants in the fulfillment of a vow made in 1633.



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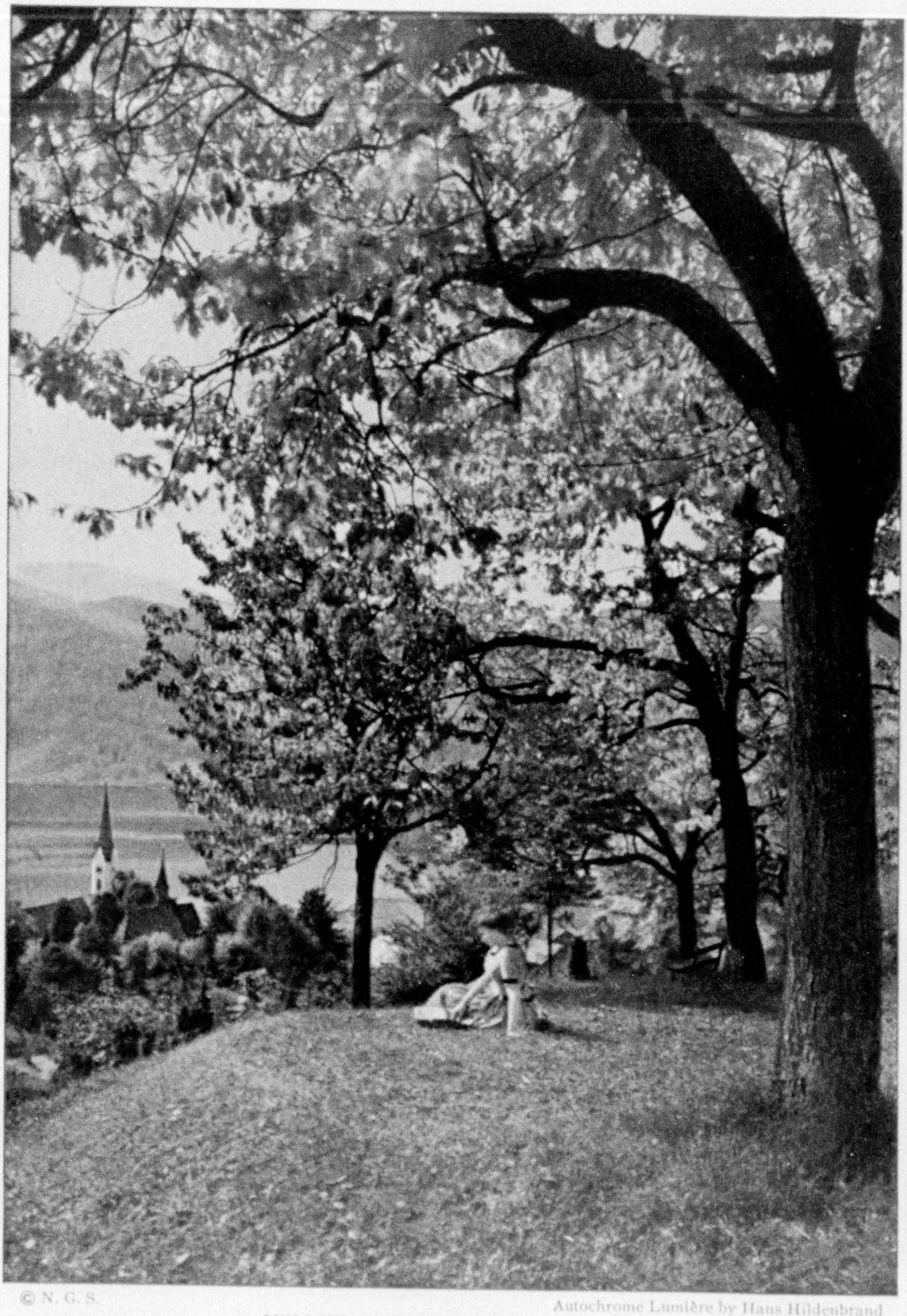
THE EMBOWERED SHRINE OF A PEASANT HOME IN OBERAMMERGAU

The religious devotion of the Bavarian is frequently made manifest in simple shrines, such as this. Especially is this true in Oberammergau, where many of the peasants in their daily lives try to emulate their rôles in the Passion Play.



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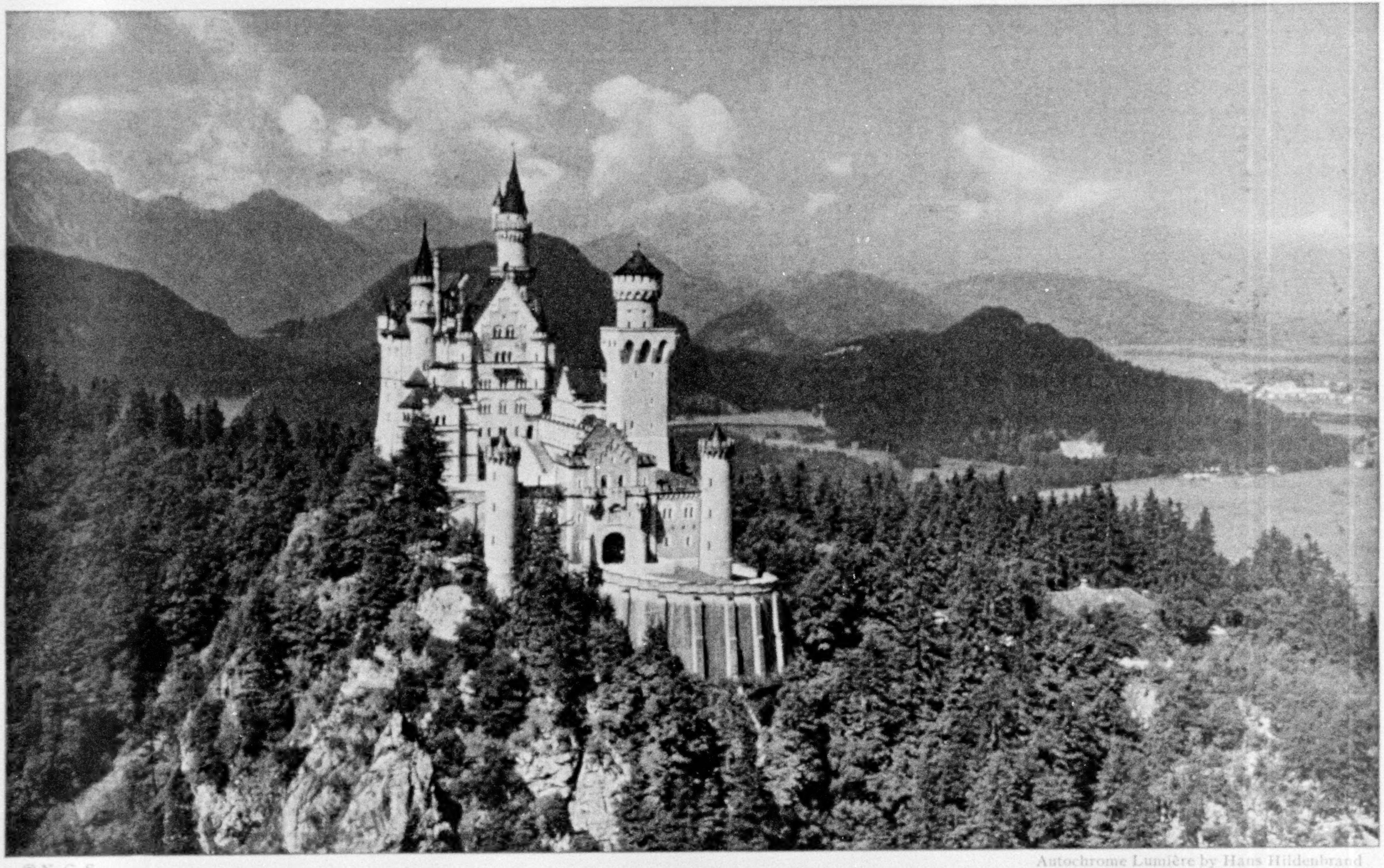
MELLOW AUTUMN ON THE SCHLIERSEE

The seeker after beauty on mountain, lake, and in gorge has every aid and device to make his journey easy in Bavaria, yet happily the glory of Nature has not been marred by the hand of man (see text page 632).



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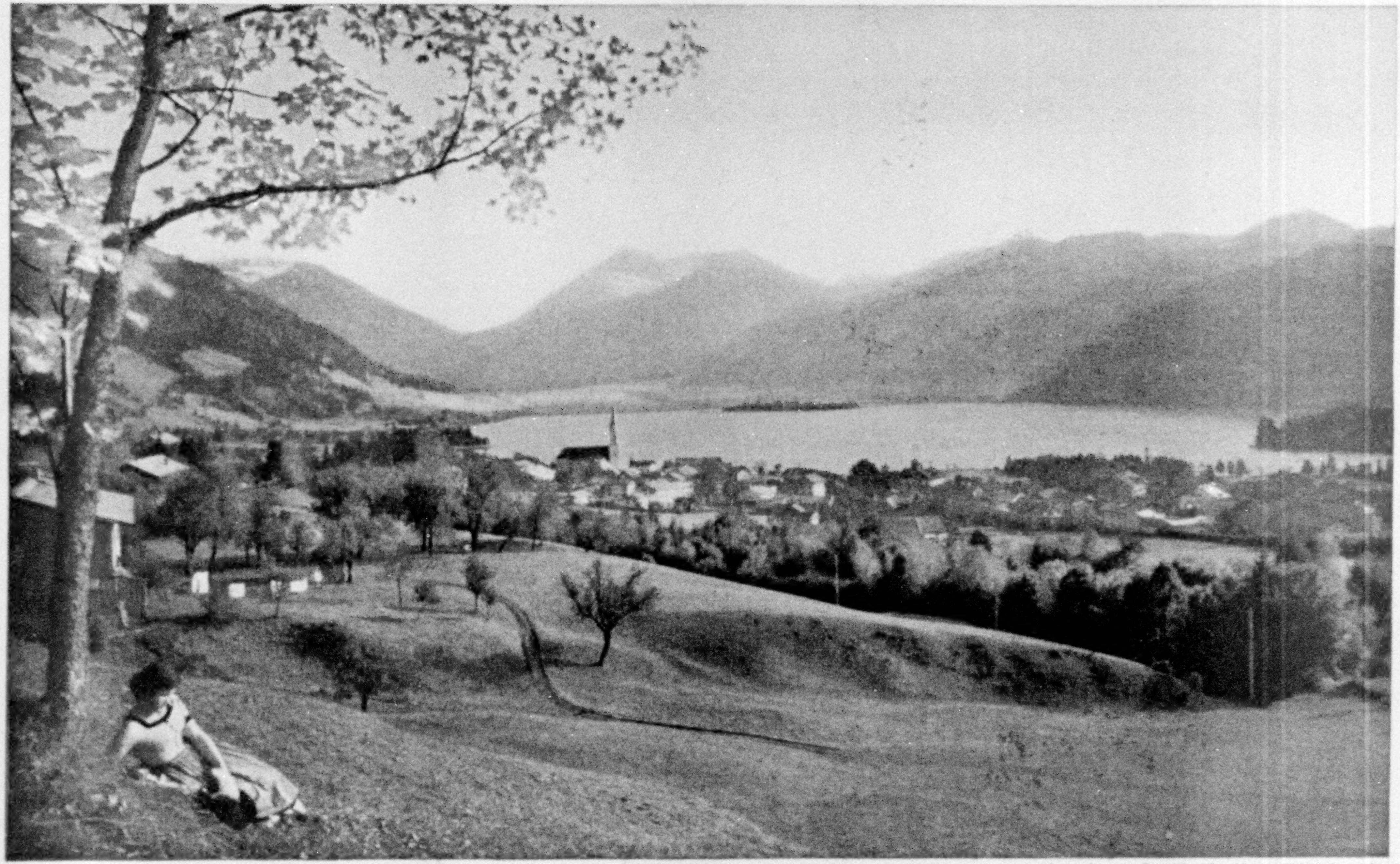
CASTLE NEUSCHWANSTEIN, PRE-EMINENT IN BEAUTY

This marble structure, erected in 1869-86 by a mad king with a passion for building (see text page 649), lifts its fairy-tale towers from a precipitous rock overlooking the bluish-green, wood-girdled Alpsee. Some of its rooms are decorated with scenes from familiar folk tales.



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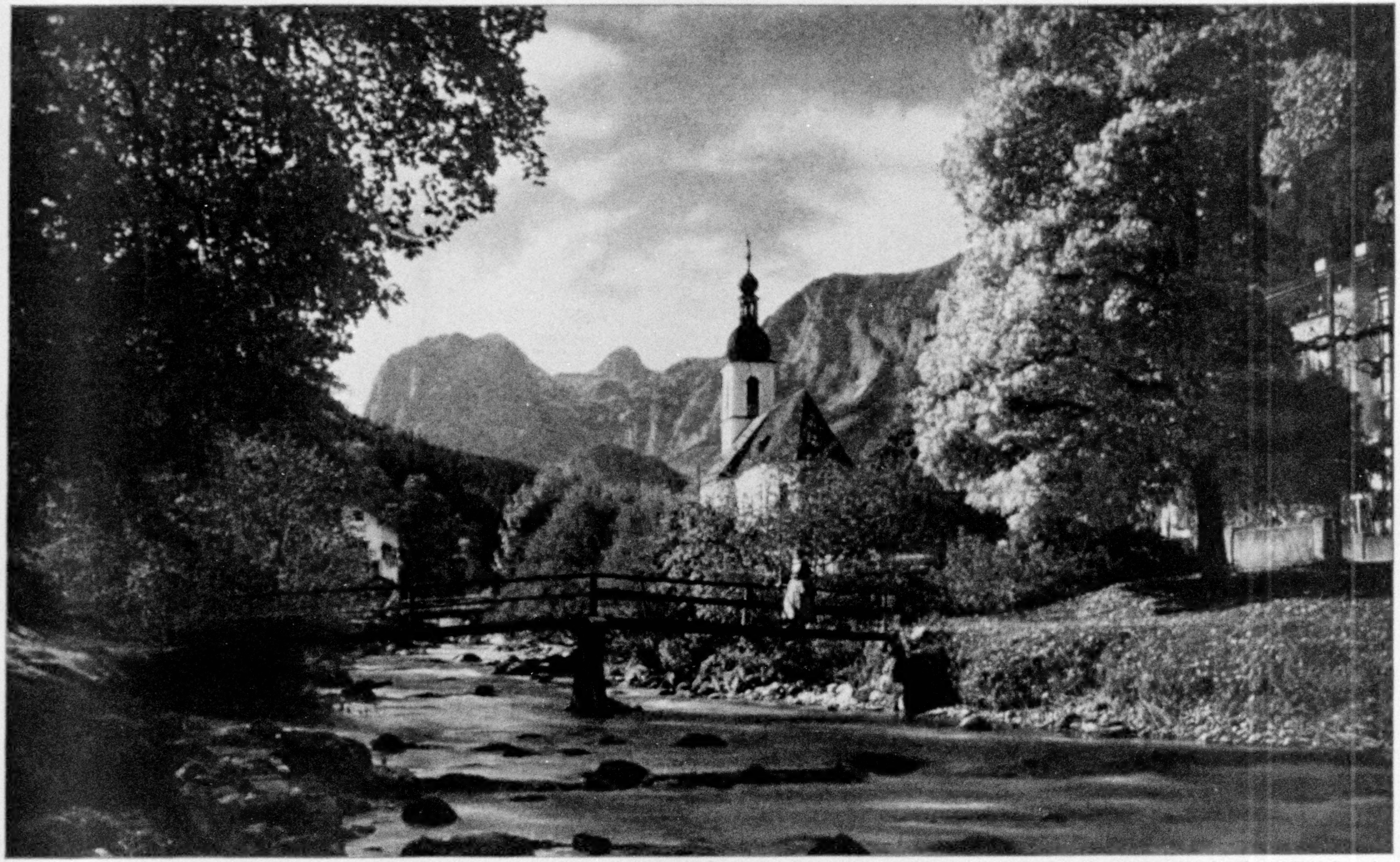
THE SCHLIERSEE NESTLING AMONG ITS PEAKS

Each of Bavaria's entrancing little lakes is well adapted for boating and picnics, and the excursion to some unique beauty spot is a favorite form of outing.



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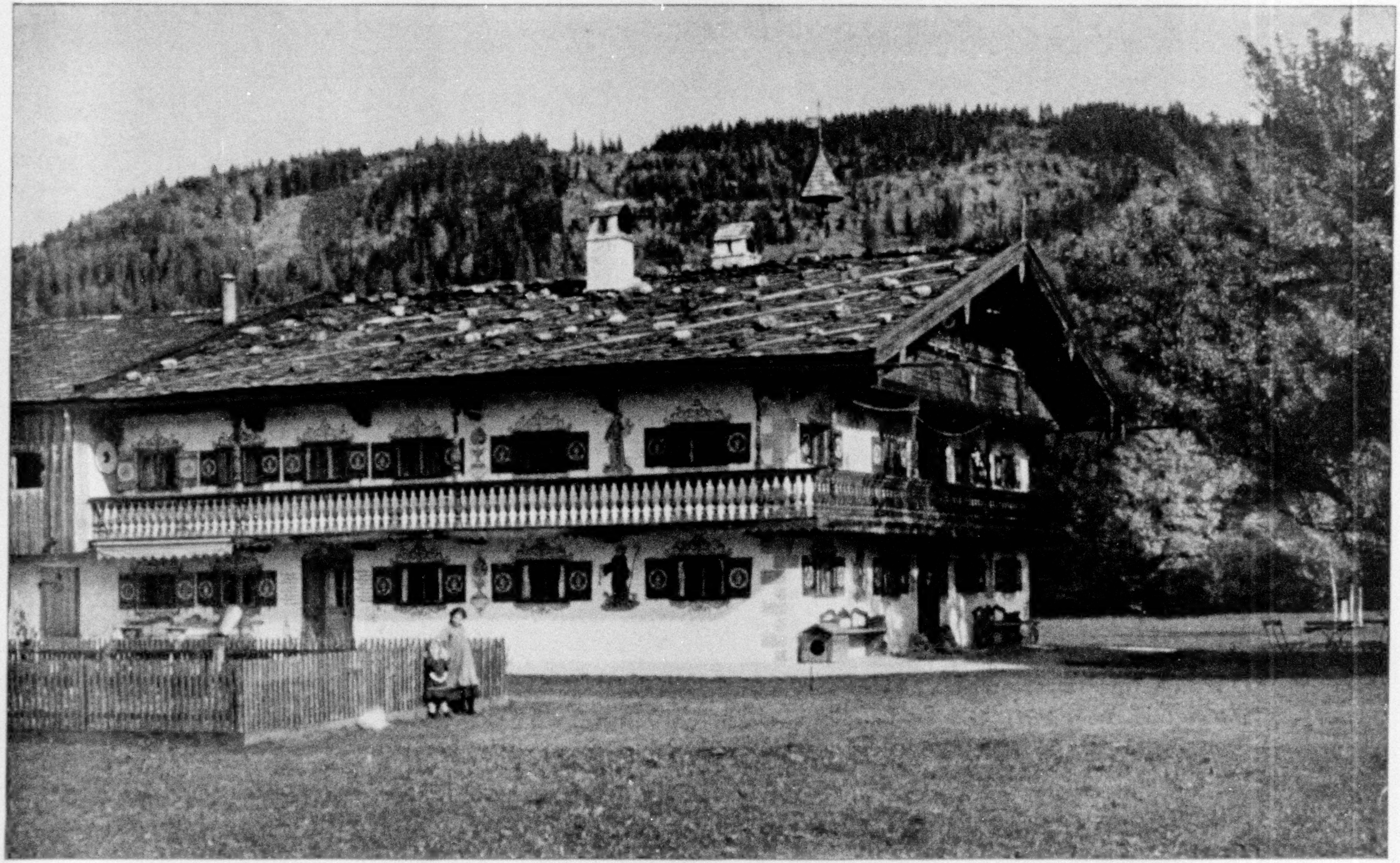
AN IDYLLIC SPOT NEAR BERCHTESGADEN, A FAVORITE WINTER AND SUMMER RESORT

In Bavaria one may drift leisurely from place to place, and, wherever the appeal is sufficiently strong, unpack and settle down to remain as long as the spell of the surrounding beauty lasts.



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A STAUNCH BAVARIAN FARMHOUSE AT TEGERNSEE

Many of the houses in the villages of the Bavarian Alps have their exterior walls painted in kaleidoscopic colors, and they are frequently adorned with scenes from Biblical history (see text page 632).

X

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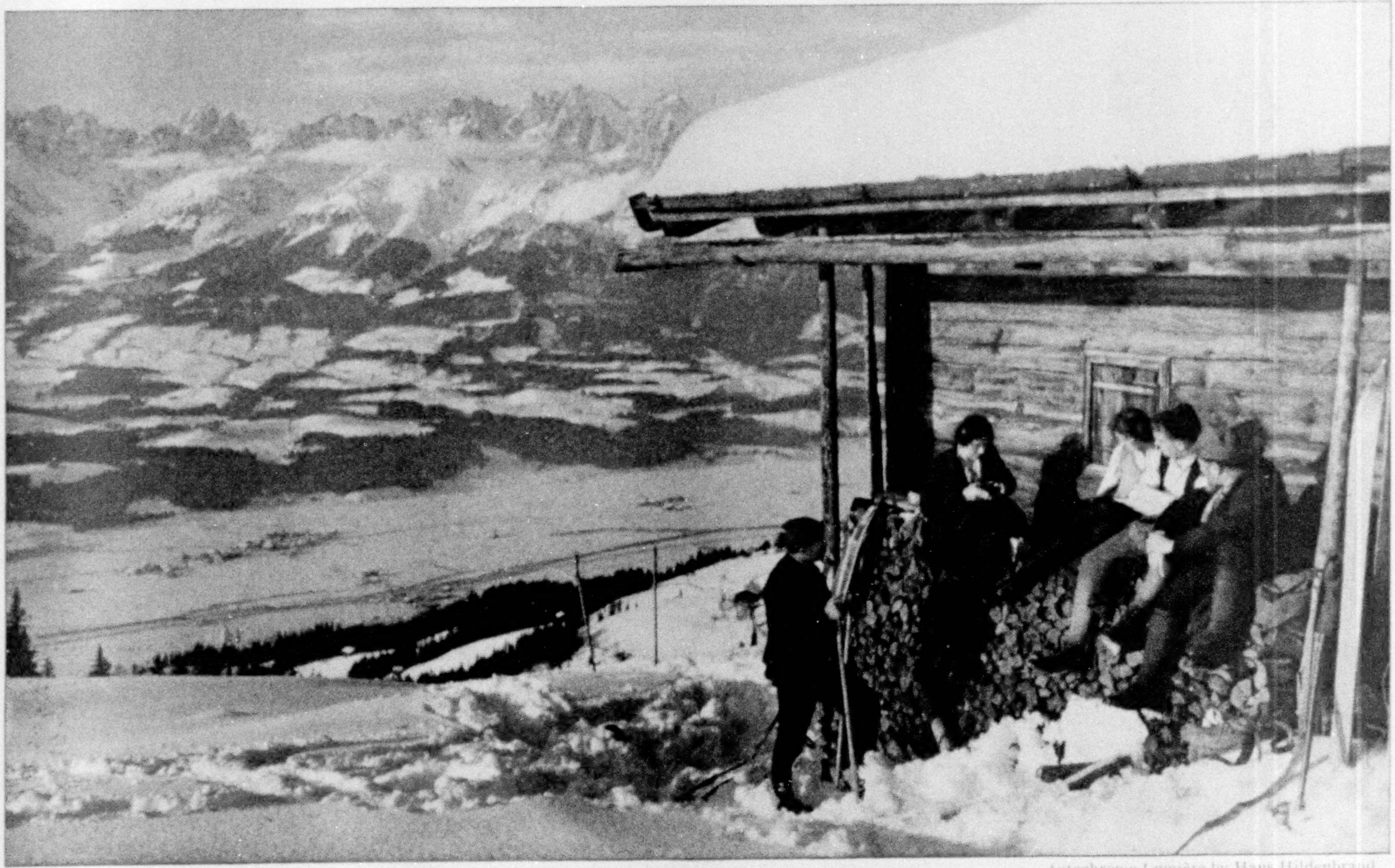
SKIING ON THE KITZBÜHLER HORN: TYROL



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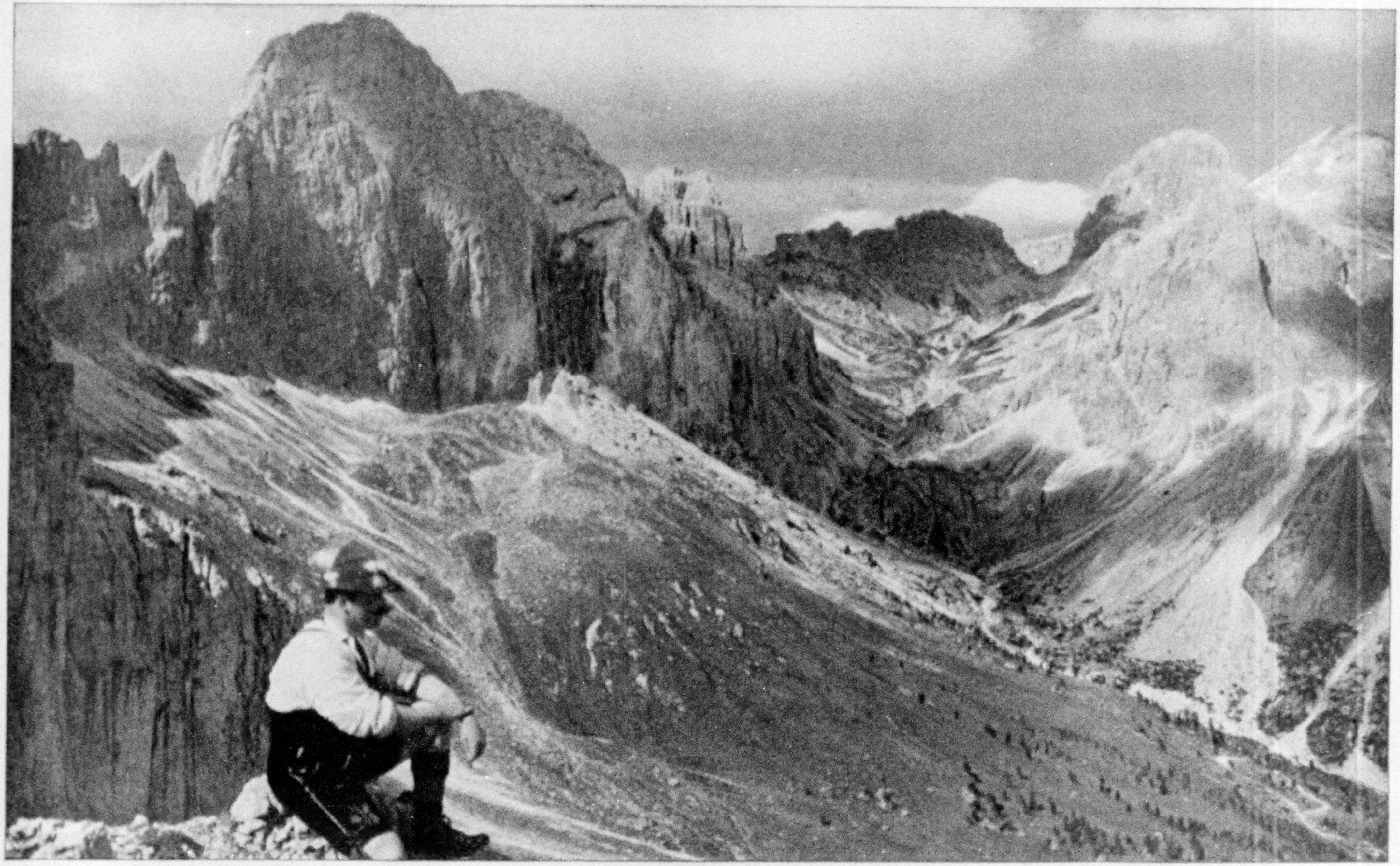
A REST AND CHAT IN THE SUNSHINE OF THE KAISERGEBIRGE

These bold, picturesque mountains are popular in summer as a practice ground for inexperienced rock climbers. They were formerly a chamois preserve, but the spread of the mountain-climbing sport made their retention as such impossible.



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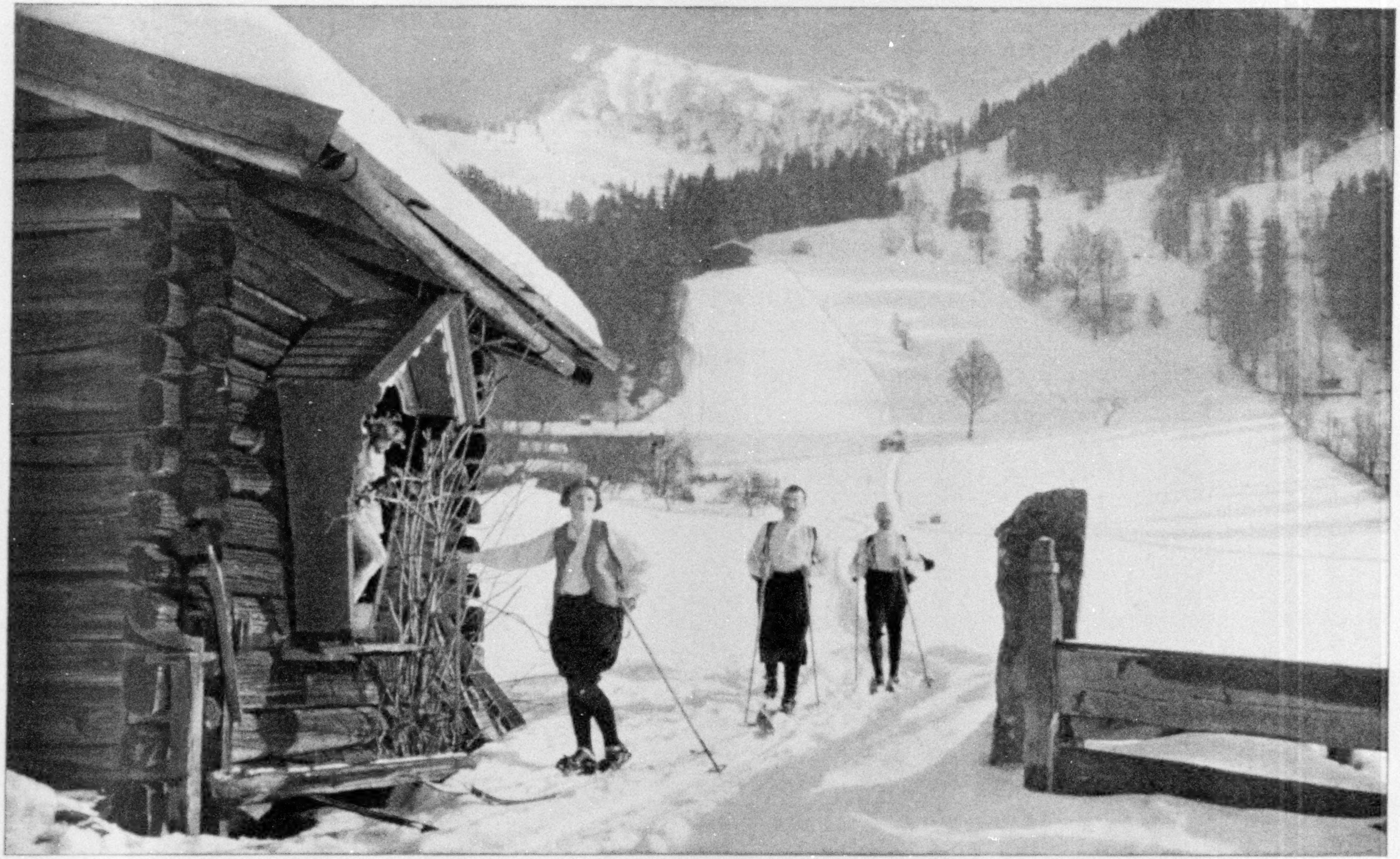
WHERE THE MOUNTAINS BLUSH

"The Garden of Roses," a mighty wall of serrated pinnacles in the Dolomite region, a part of which is now under the Italian flag (see also Color Plate XIV), consists literally of flowers of stone, for at dawn and at twilight the sun's rays transform the peaks into glowing masses of rose and red.



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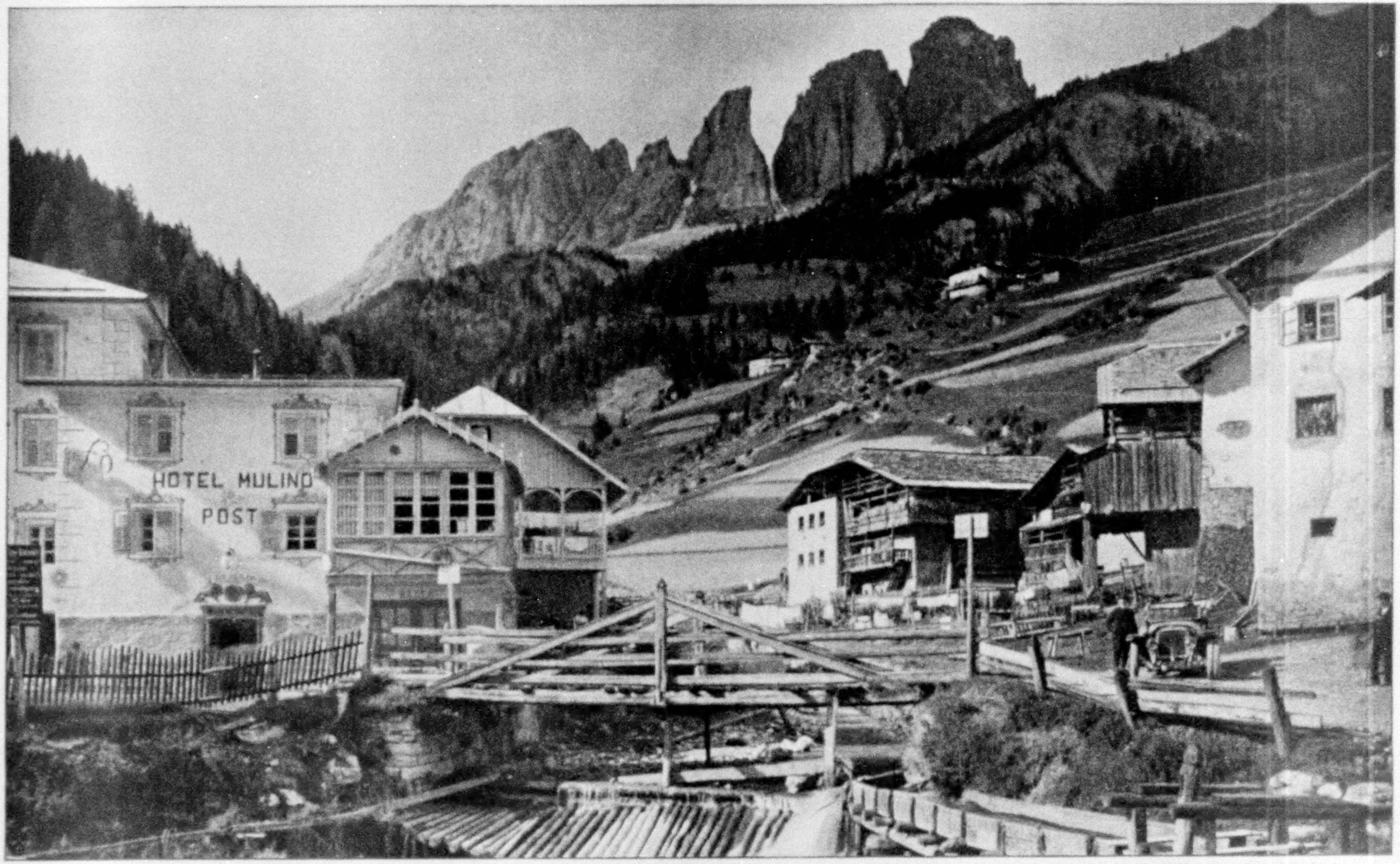
ON THEIR WAY TO THE KITZBÜHLER HORN (SEE ALSO COLOR PLATE X)

Many of the routes to the highest of the Tyrolean peaks are clearly marked, necessitating no guide. As in the Bavarian Alps, mountain huts here and there along the trail offer rest and refreshment to the summer and winter climber.



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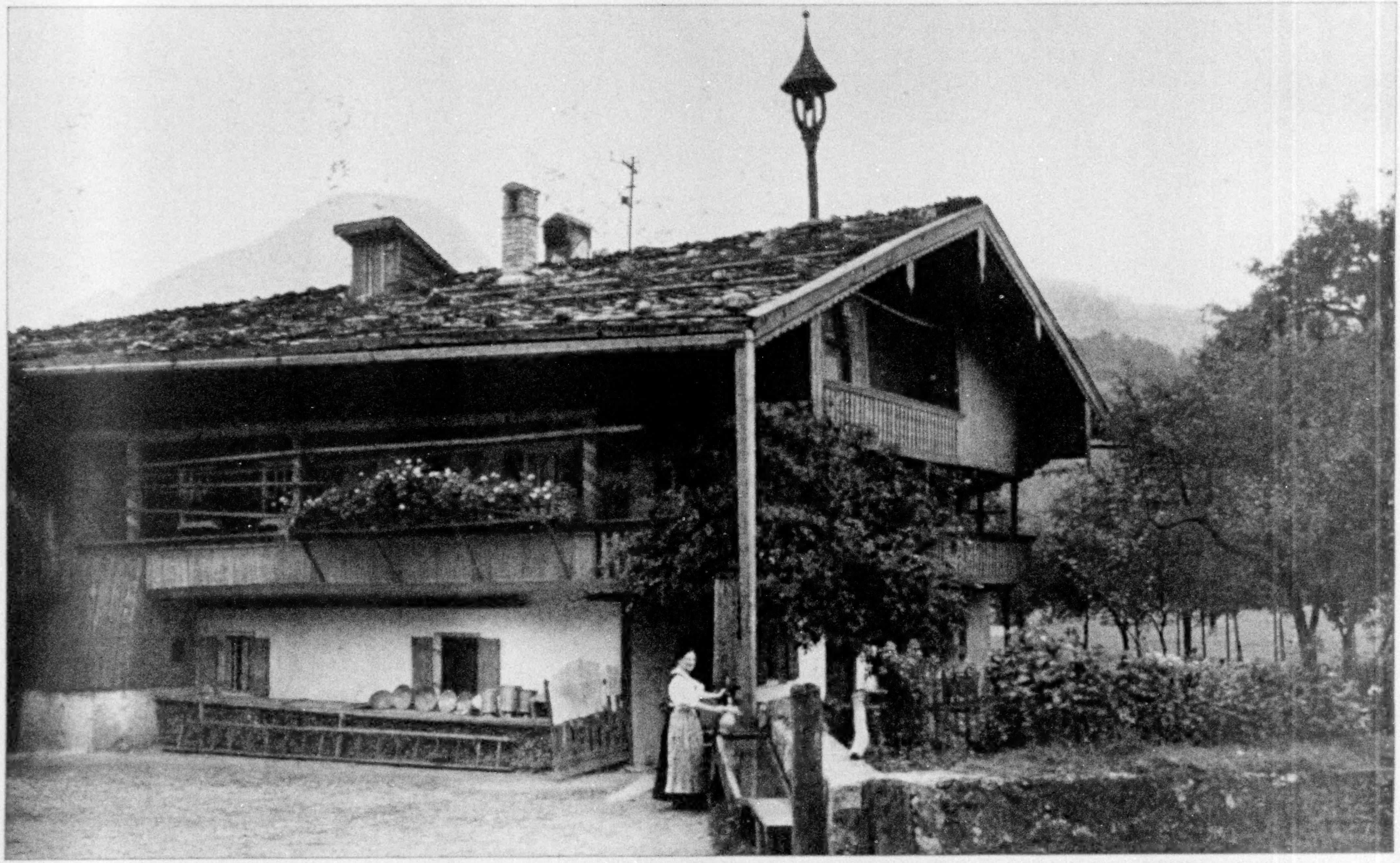
A GEOLOGICAL FANTASY—THE DOLOMITES: CAMPITELLO

The weathered limestone masses of the Dolomites present a weird variety of bleak cliff, fissured summit, needle, and spire. The rocks' prevailing color is an ashy gray, in contrast with the somber and vivid greens of pinewoods, larch forests, and alpine grassland at their base.



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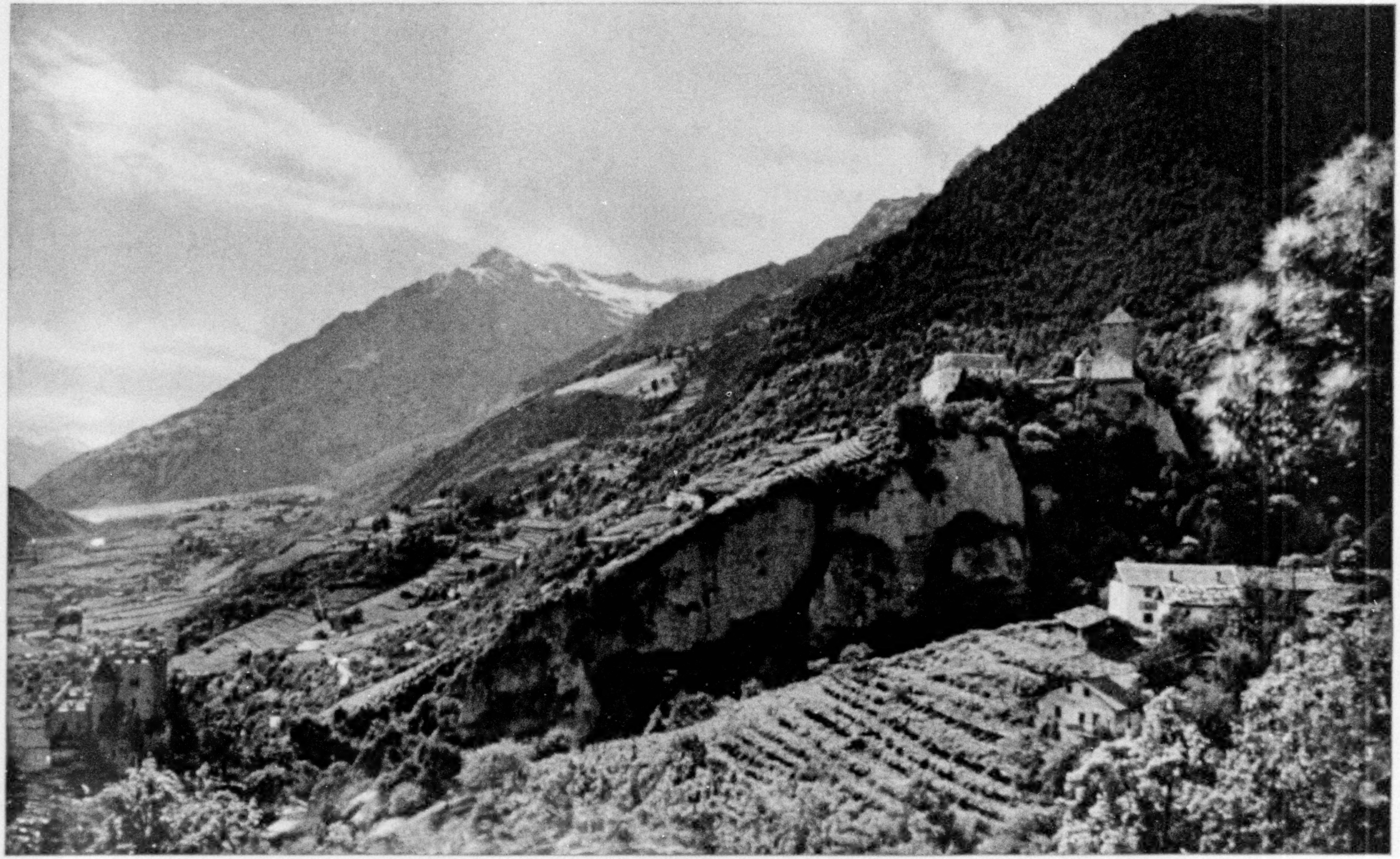
A HOME OF PEACE IN NORTHERN TYROL

The larch shingles of the Tyrolese roof, held in place by heavy stones (see also Color Plate IX), are gradually giving way to the less picturesque but more utilitarian tiles. The housewife is proud of her thrifty blooms in the balcony flowerboxes under the eaves.



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CASTLE TYROL, A MOUNTAIN EYRIE OLD IN STORY

This "hyphen between Teutonic and Romance Tyrol" is the Mountain Land's historic heart, from which it derived its name. The venerable stronghold, originally a monastery, occupies the projecting promontory once held by a Roman fort.

of a handful of foreigners who have gone through the red tape of the customhouse there, for it is close to the Austrian border, and a smaller handful of violinists who seek perfection in their instruments, it is little known. Yet this unheralded village produces violins that are exported to every country in the world. Violin-making is an art, an exceedingly exacting one. In Mittenwald it has approached a perfection that knows few competitors.

Garmisch lies in the shadow of the Zugspitze, Germany's highest point above sea-level, and directly in front of the town the Alpspitze rears its snowy cap. The town is a popular winter-sport resort for the citybred folk of Munich and other large Bavarian towns.

As a winter resort, however, Garmisch is practically unknown beyond the borders of Germany. But if you enter a fine-art shop in Munich, Dresden, Berlin, Cologne, Vienna, Stockholm, Brussels, Paris, London, Rome, New York, and a hundred other widely scattered centers, and go through a collection of fine etchings, you will almost certainly come across some wonderfully appealing piece of work, and perhaps many pieces, by Paul Geissler.

These etchings and the artist who not only conceives them and picks them out on the copper plate, but turns them out with his own hand from his own presses, are the products of the artistic environment of the place wherein he lives and works—Garmisch, in the Bavarian Alps.

### COUNTLESS WATERFALLS IN MAGNIFICENT GORGES

In the gorges, especially the Partnach-klamm and the Höllental-klamm (Hell Ravine), there are countless little streams that begin their plunge down the precipitous walls, hundreds of feet above, as waterfalls, and before half the distance to the bottom of the gorge is reached, have dissolved into mist more delicate than any cloud, more filmy than any lace.

In the few rare instances where the sunlight penetrates such gorges at just the proper angle and strikes the mist, yet another transformation takes place and a miniature rainbow is born.

So frequent are these fairy waterfalls in Partnach-klamm that umbrellas or raincoats are recommended for even a cloudless day.

And the lakes! It is indeed difficult to say whether there is greater beauty in looking aloft at the snow-covered Zugspitze stabbing the blue sky than there is in looking into the clear waters of Eibsee and seeing it all reflected in the placid depths.

### COMFORT AND SAFETY OF THE TRAVELER ARE SAFEGUARDED

The Bavarians have surrounded the seeker after beauty in his mountains with every device and aid to make his journey easy and safe, without in any way marring the glory of it all.

Along the sheer rocks, precipitous walls of canyons, trails have been cut in the solid granite and wherever it appeared that the hand of man might in any marked way deface the handiwork of God, tunnels have been constructed at great labor.

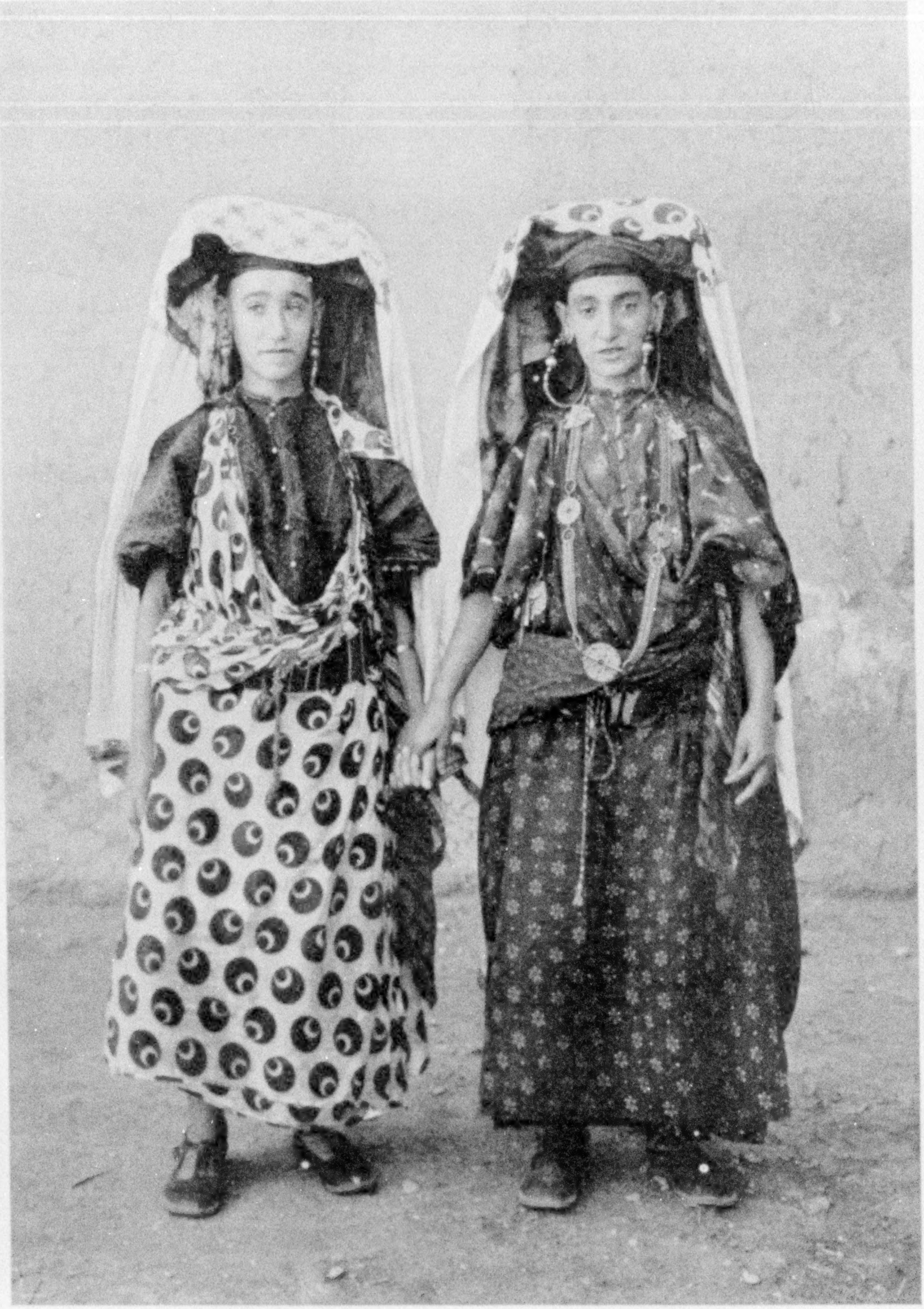
The routes to the highest peaks are clearly marked, and if these are followed the visitor may, without unnecessary fatigue or danger, climb to the roof of a continent.

Here and there along the routes are to be found hospices, where a rest and often a meal may be had.

Perhaps the professional alpinist would scorn these accessories provided to assist him in reaching his objective. However, to the searcher after grandeur rather than excitement these aids are most welcome.

Ludwig II, who committed suicide in 1886—the monarch whom Bavaria called an artist and the rest of Europe declared a madman—built a number of castles and lodges throughout this mountainous section of his kingdom, the two most imposing palaces being Schloss Linderhof, not far from the village of Ettal, and Neuschwanstein, close to the Austrian border and overlooking Alpsee, a jewel lake (see Color Plate VI).

A distinguished American novelist has declared Neuschwanstein the most beautiful spot in the world. I do not know how much of the world she had seen when she wrote that, but she could add the sum total of my journeyings to her own and still feel no inclination to alter her opinion regarding the preëminent beauty of Neuschwanstein over every other spot.



TWO LADIES OF COLOMB BÉCHAR WHO WISHED THE CITROËN CENTRAL AFRICAN EXPEDITION BON VOYAGE

From Algeria to Madagascar caterpillar cars carried 17 adventurous individuals through territory never before crossed by mechanical means (see text, pages 651-720).

# THROUGH THE DESERTS AND JUNGLES OF AFRICA BY MOTOR

## Caterpillar Cars Make 15,000-Mile Trip from Algeria to Madagascar in Nine Months

By Georges-Marie Haardt

*With Illustrations from Photographs by Members of the Citroën Central African Expedition*

FIFTEEN thousand miles by motor through the heart of Africa reads almost like a figment of Jules Verne's fertile imagination, but it represents the actual accomplishment of the Citroën Central African Expedition, which it was my privilege to lead from Algeria to Mozambique and on to Madagascar.

Our original purpose was to demonstrate the feasibility of motor transport in these wild regions, and to trace a route which might later enable the French Government to project a railroad that would connect two of its greatest provinces, now separated by thousands of miles of desert and jungle.

This was soon broadened, however, to include official missions for the Colonial Office, the Air Ministry, the French Natural History Museum, and the French Geographical Society, all of which added materially both to the complexity of the arrangements and the interest of the trip.

A detailed and connected account of all our adventures is beyond the compass of this article and must be reserved for several volumes, but I am including here the more interesting incidents of a journey which daily revealed the mysteries and beauties, and in some instances the terrors, of a little-known world.

### EIGHT AUTOMOBILES EQUIPPED WITH TRACTORS MAKE THE TRIP

The personnel of the expedition included my two assistants, M. Louis Audouin-Dubreuil, second in command, and Major A. Bettembourg. A motion-picture producer, M. Léon Poirier, was in charge of our cinematographic work, with M. Georges Specht as camera operator.

M. Alexandre Jacovleff accompanied us to make sketches, while Dr. Eugène Bergonier provided medical attention and taxidermic supervision, and M. Charles Brull was in charge both of our mechanical department and mineralogical and geological research. Nine mechanics, all experienced in Saharan travel, completed the party.

Our eight 10-horsepower Citroën cars were equipped with the Kegresse-Hinstin-type caterpillar system in addition to regular front wheels. Because of the great amount of equipment which had to be carried on so elaborate a trip, it was necessary to provide each car with a trailer, and both cars and trailers with extra water, gas, and oil tanks.

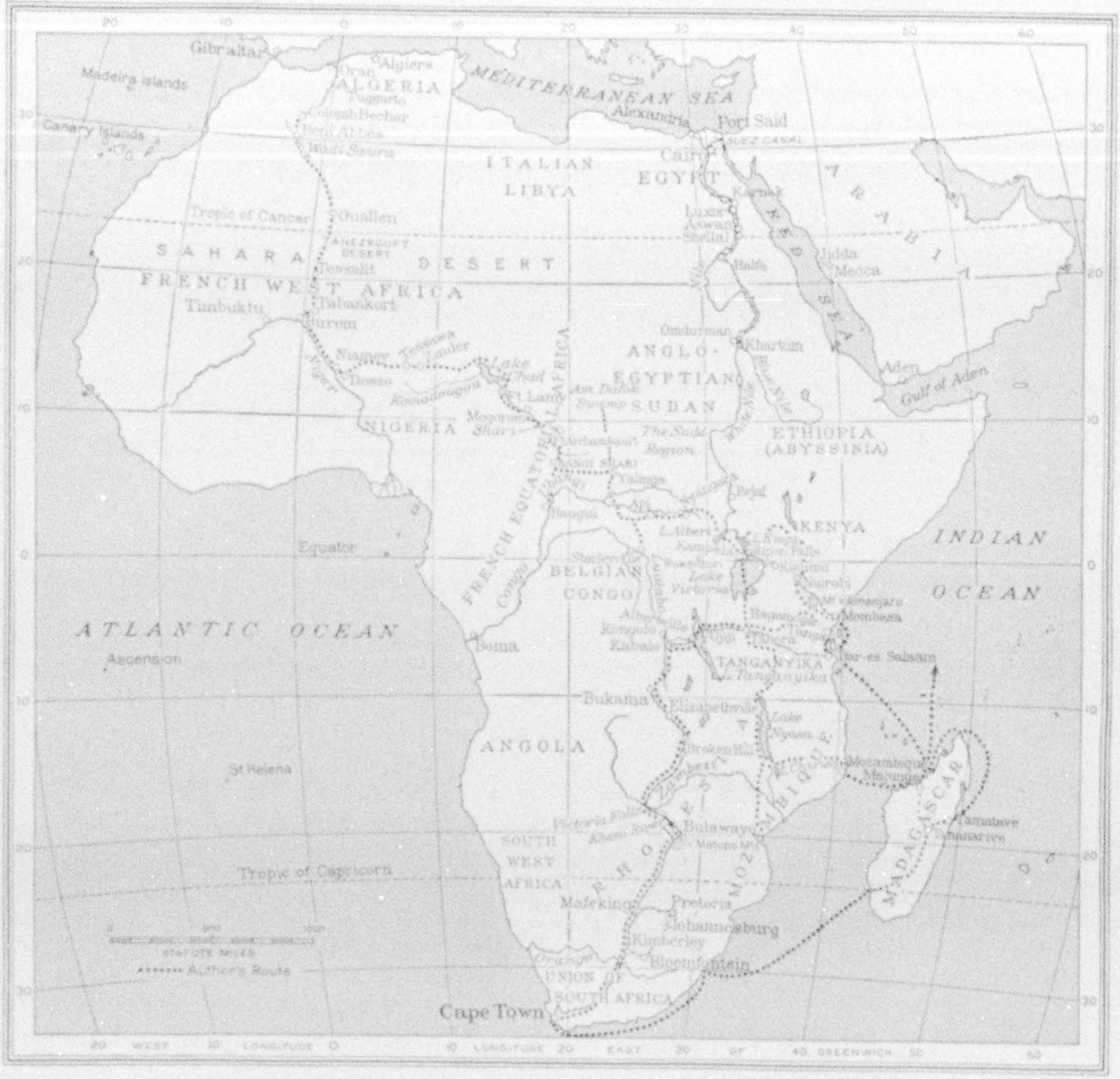
### EIGHTY TONS OF SUPPLIES SENT AHEAD

In order that we might not upset the economic equilibrium of the remote places through which we were to pass, and that we might be sure of our sustenance, we sent from France nearly all of our supplies. Depots were established at intervals along the route and more than 80 tons of foodstuffs, general and mechanical supplies, were distributed to them some weeks before we started.

After 10 months of careful and painstaking preparation, we left Colomb Béchar (see map, page 652) on the morning of October 28, 1924, to cross deserts and penetrate jungles, some of which had never before been traversed by mechanical means.

As our caterpillar cars spread through the miniature ravines and over the hillocks of the South Algerian Plain, they looked for all the world like the vessels of a flotilla performing maneuvers on a rough sea.

The initial stage of the journey took us across the great Sahara to Burem, on the Niger River, but ours was not the first mechanically transported party to make


Gibraltar
Madeira Islands
Canary Islands
Oran
Algiers
ALGERIA
Tuggurt
Colomb Bechar
Beni Abbes
Wadi Saura
MEDITERRANEAN SEA
Alexandria
Port Said
SUEZ CANAL
Cairo
ITALIAN
LIBYA
EGYPT
Karnak
Luxor
Aswan
Shellal
ARABIA
RED SEA
Tropic of Cancer
Ouallen
SAHARA
TANEZROUFT DESERT
DESERT
Tessalit
FRENCH WEST AFRICA
Timbuktu
Tabankort
Burem
Halfa
Jidda
Mecca
Omdurman
Khartum
ANGLO-EGYPTIAN
SUDAN
Niamey
Tessaoua
Zinder
Lake Chad
Dosso
Niger
Ft. Lamy
NIGERIA
Moyoro
Shari
FRENCH EQUATORIAL AFRICA
The Sudd Region
ETHIOPIA (ABYSSINIA)
Aden
Gulf of Aden
Bangui
L. Albert
Kampala
KENYA
INDIAN OCEAN
Equator
Stanleyville
BELGIAN CONGO
Lake Victoria
Nairobi
Mombasa
Kilimanjaro
Congo
ATLANTIC OCEAN
Ascension
Boma
Albertville
Kabalo
Dar-es Salaam
TANGANYIKA
L. Tanganyika
Bukama
Elizabethville
Lake Nyasa
ANGOLA
Broken Hill
Mozambique
MOZAMBIQUE
St Helena
Victoria Falls
Bulawayo
Matopo Hills
MADAGASCAR
Tamatave
Tananarive
SOUTH WEST AFRICA
RHODESIA
Tropic of Capricorn
Mafeking
Pretoria
Johannesburg
Kimberley
Bloemfontein
Orange
UNION OF SOUTH AFRICA
Cape Town
STATUTE MILES
Author's Route
WEST LONGITUDE
EAST LONGITUDE GREENWICH

Drawn by A. H. Bumstead

THE ROUTE OF THE CITROËN CENTRAL AFRICAN EXPEDITION

For nine months eight 10-horsepower automobiles equipped with caterpillar tractors pushed their way diagonally across Africa from Colomb Béchar, the railhead south of Algiers, to the Mozambique Channel, and thence across to Madagascar. On the shores of Lake Victoria the Expedition began to separate into groups of two cars each, and pursued their journey by various routes (see text, page 705). For a crossing of Africa from Cairo to Cape Town, partly on foot, see Felix Shay's narrative in the NATIONAL GEOGRAPHIC MAGAZINE for February, 1925.

this trip. Nearly two years before, in December, 1922, and January, 1923, the Citroën Caterpillar Tractor Expedition crossed from Tuggurt to Timbuktu, definitely outdistancing the camel in his own domain by making the 2,000-mile journey in 20 days instead of the customary three months.*

Crossing the desert, even though we were fortified with the experience of this earlier passage, was still no easy task.

After leaving the magnificent oasis of Beni Abbes, which stretches its long, green trail of palm trees along the bed of the Wadi Saura, we encountered what we thought at the time was rough going; but when, on November 10, we entered the almost unknown Tanezrouft, we embarked on a desert compared with which the wilderness we had already crossed was as nothing.

It is a country utterly devoid of resources: no water, no wood, no grass, no growing, living thing. In crossing from Ouallen to Tessalit we traveled more than

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* See "The Conquest of the Sahara by Automobile," in the NATIONAL GEOGRAPHIC MAGAZINE for January, 1924.

THE MARKET AT COLOMB BÉCHAR, THE STARTING PLACE

This important outpost of the French in Africa lies on the northern edge of that arid hinterland of Algeria known as the Southern Territories. It is more than 400 miles by the Algerian State Railway from Colomb Béchar to Oran, "the Chicago of Africa," on the Mediterranean.

330 miles without finding a drop of water.

It was in this stretch of desert inferno, some 50 miles out from the Ouallen well and still within plain sight of the mountains surrounding it, that we found the dried skeletons of several travelers who had died of thirst. These bleaching bones were all that remained of a caravan from the Sudan that had miscalculated its water supply (see page 660).

The Arabs say that death in the desert from thirst is an indescribable sustained torture in which the whole body dries up. The contact of clothing becomes insufferable and it is discarded, but only to let the cruel rays of the scorching sun inflict additional torment.

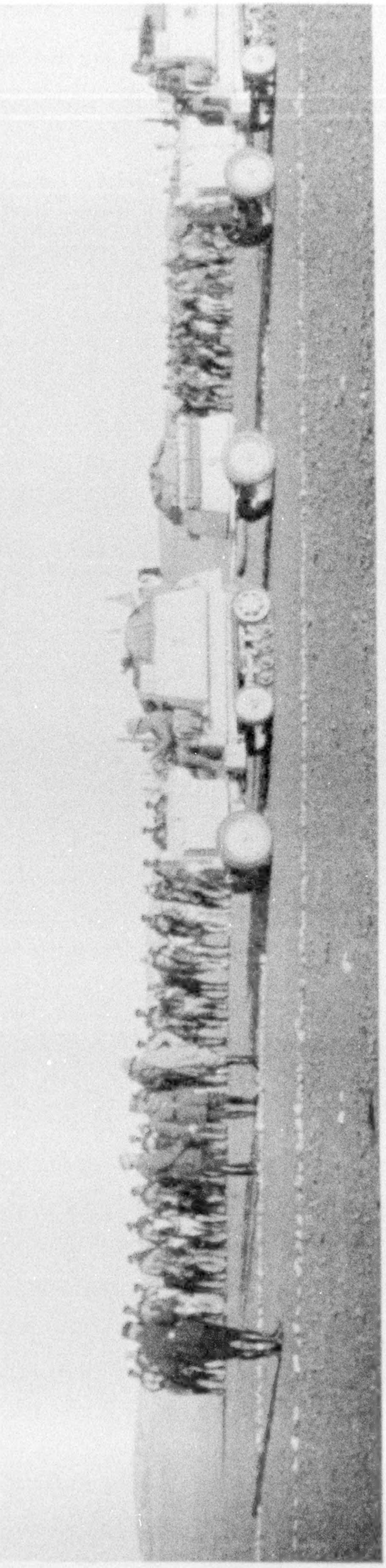
The desert peoples exercise great care in dealing with those who are suffering severely from thirst, as it would be fatal to give them drink at once. First, their lips are moistened, then the body is rubbed gently with a wet cloth and bathed slowly for several hours. A small quantity of milk is administered after a while, and finally a swallow of water. Sufferers who have been thus rescued sometimes remain dull and mentally befogged for a long time.

After driving for five days in the Tanezrouft our nerves began to feel the effects of its monotony and the vastness of its solitude. Coincidentally we experienced all sorts of difficulties. The cars seemed to sink deeper and deeper into the sandy ground and consumed great quantities of gasoline, due to the necessity of an almost constant use of second gear.

### MACHINE GUNS MOUNTED TO WITHSTAND ATTACKS OF ROBBERS

The blinding brilliance of the sun, the intense heat, and the foul smell of gasoline, caused by an everlasting rear wind, all had a disturbing effect and contributed toward the development among us of a very real anxiety lest our gas or water fail before we reached the oasis at Tessalit. Our fears proved groundless, however, for we sighted waving palms before our supply of either was near exhaustion.

As we approached the vicinity of this oasis we took precautions to guard against the robbers who sometimes frequent it.



OFF FOR MADAGASCAR

After ten months of preparation, the Citroën Central African Expedition started across the Sahara from Colomb Béchar, the southern terminus of the Algerian railway system. This town is an army post, and the troops accorded military honors to the departing explorers.

At night our camp became practically a war bivouac. We parked our caterpillar cars so as to form a hollow square and mounted loaded machine guns in positions to command all approaches.

The members of the party took turns doing guard duty, but our improvised fortresses were never attacked, and the only sounds that broke the oppressive stillness of the night were the steady tramp of our sentry and the occasional yelp of a lonely jackal.

While to most Europeans everything on the desert looks much alike, the Arabs and Tuaregs seem to know their way about quite confidently. We had as one of our guides a Tuareg who claimed not to have been over parts of the way since he was two years old, but he was able to retrace his earlier journey with sufficient accuracy to bring us to the well we sought.

After replenishing our water tanks, we set out again; but our guide had evidently never crossed this part of the country at all, for before two hours had passed we came suddenly upon a great heap of impassable rocks. The guide, if such he might still be properly termed, counseled an immediate return to Tessalit and predicted dire calamities in the event of our failure to heed his advice.

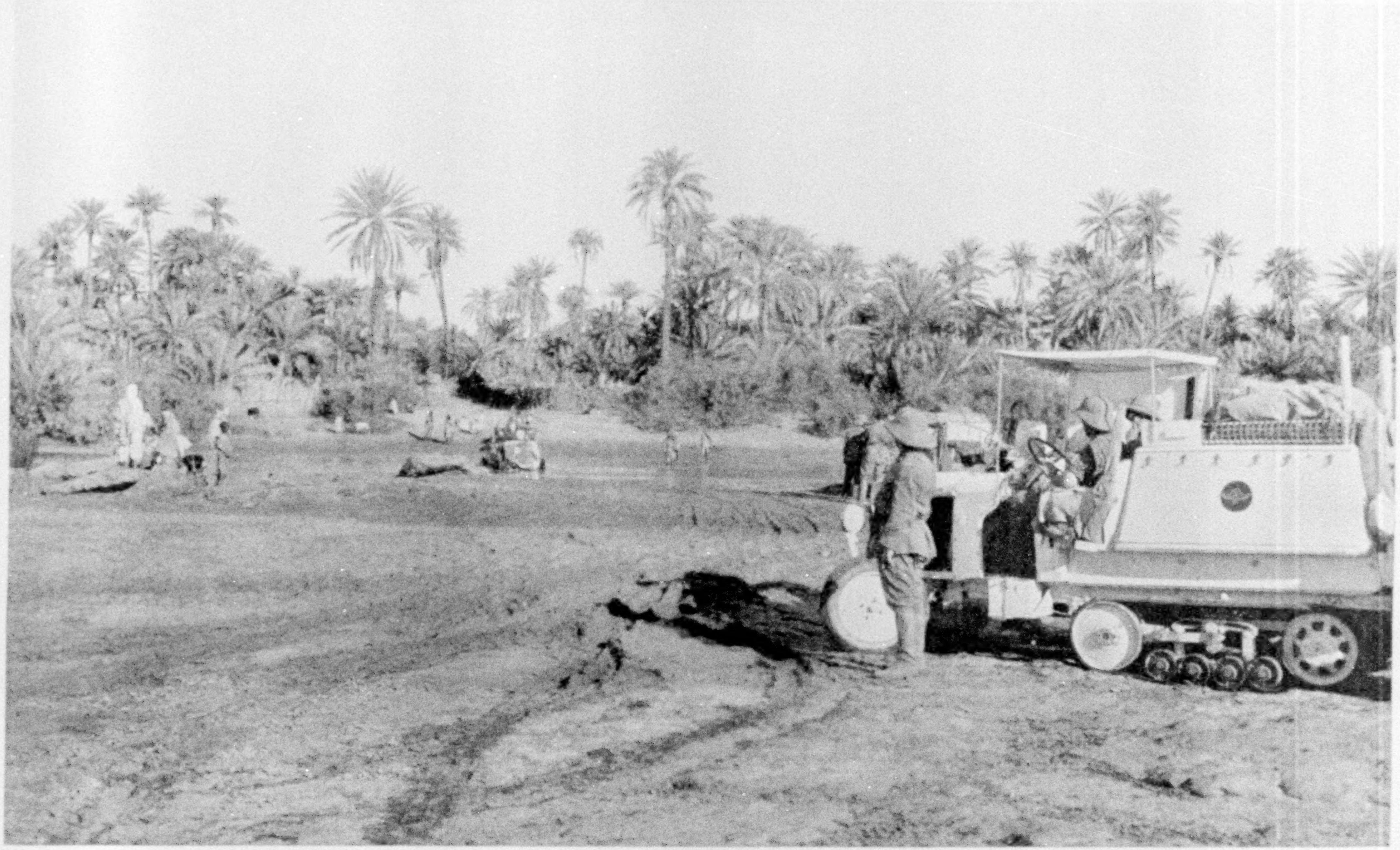
### SILVER STIMULATES A TUAREG'S MEMORY

While we were hesitating as to what course to pursue, help came from a most unexpected quarter. Indeed, it came from directly behind one of the impeding rocks in the person of a strange Tuareg, who appeared as if out of the earth.

At first no amount of questioning brought forth any information about the route to Tabankort, but finally Major Bettembourg produced a silver coin. The Tuareg's eyes brightened and he immediately remembered the way to a well some kilometers beyond. A second coin further stimulated his obliging memory, and display of a handful of silver brought clearly to his mind the way not only to Tabankort, but on to Timbuktu.

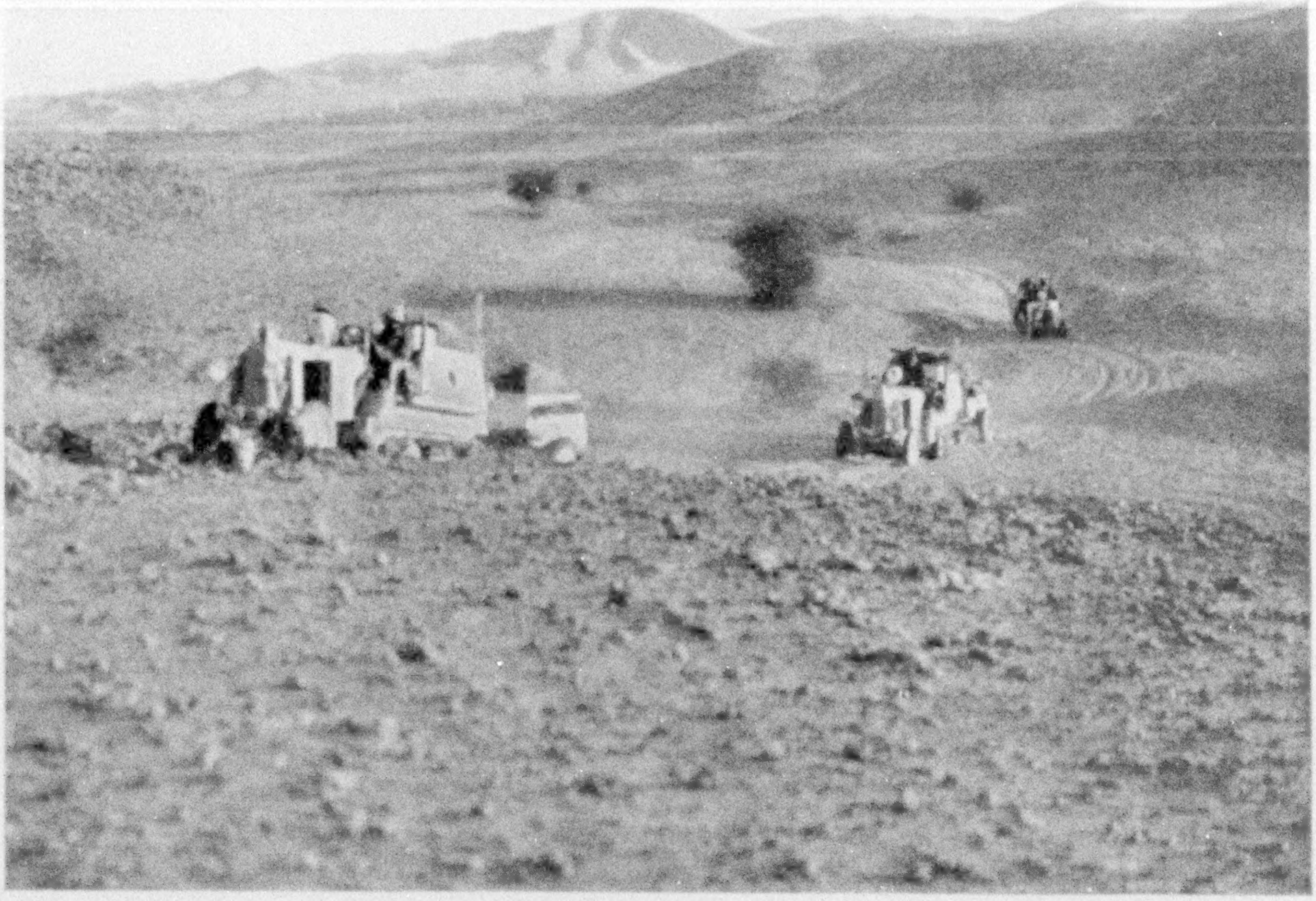
Ikenen (for such was his name) proved a good guide, and we soon reached the Tabankort well, where a Tuareg camp lent an interesting touch to the scene.

The character of these people has been much embellished by myth and legend,



CROSSING THE WADI GIR, A SMALL STREAM SIXTY MILES SOUTH OF COLOMB BÉCHAR

Each of the eight cars could accommodate three persons and, with its trailer, was an independent unit, carrying its own tools, tents, and foodstuffs. If separated from the others, a one-car contingent could provide for its own needs for several days.



PLOWING THROUGH A WASTE OF SAND HILLS AND ROCKS BEFORE REACHING BENI ABBES (SEE PAGE 652)

and indeed their haughty demeanor, majestic bearing, and picturesque equipment do make them look like the survivors of some high and mighty lords of the past.

The men wear a veil which covers the whole face and brings to mind the helmets of the Crusaders. Each tribesman usually carries a spear, a saber held at the wrist by a leather thong, a cross-shaped guard sword at his side, and a shield made of antelope hide (see page 665).

### TUAREGS MAINTAIN A FEUDAL STATE

The Tuaregs are divided into castes. The *imochars* are noblemen from among whom the leaders are recruited and who hold courage and chivalry in high esteem. The *imrads* are vassals who, like their lords, are of Caucasian blood. The *bellahs* are servants, of negroid stock. Each vassal tribe depends upon some noble tribe for protection, pays taxes to it, and provides warriors when called upon. The castes never intermarry.

Women occupy a favored position, living very independently and, quite the reverse of the Arab custom, going unveiled, while the men cover their faces.

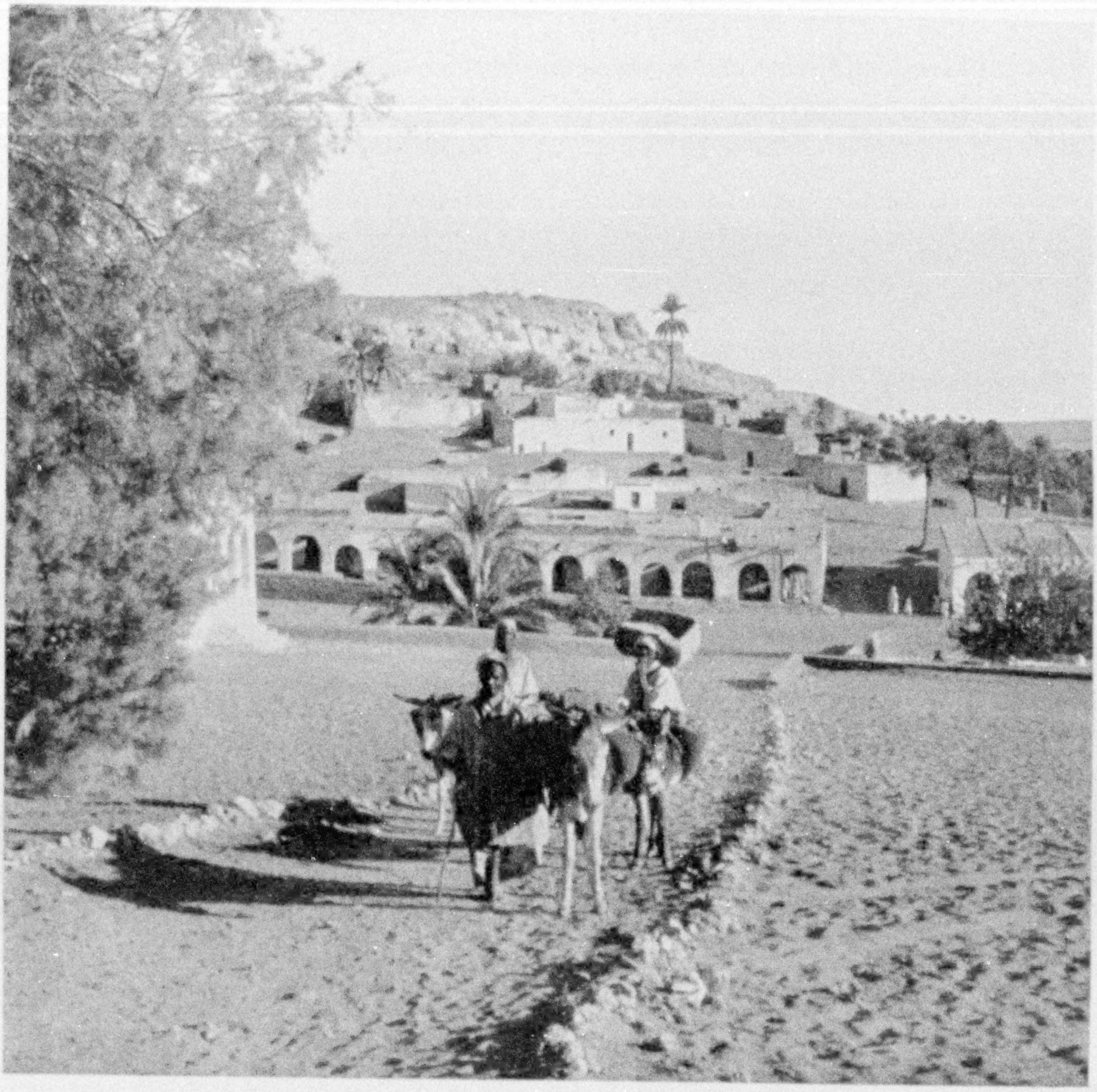
Just three weeks after taking off from Colomb Béchar we reached the fort of Burem. This post rises rather impressively on a hillock overlooking the Niger, a lordly stream more than 2,500 miles in length and over a mile wide at this point.

Here the Administrator of the Niamey District met us on behalf of the Governor of the Colony. He was surrounded by a magnificent group of men, some on horseback, others on camels, and all with drawn swords in hand.

They proved to be River-Tuaregs under the command of their chief, Ngouna, and gazed in frank astonishment at our caterpillar cars, because they showed no signs of weariness after crossing the desert.

Following the course of the Niger to Niamey, the administrative capital of the region, we were accorded a royal welcome by a large crowd, which had gathered to see the strange, tireless "beasts" that had brought us across the desert and would carry us on into the jungle.

An odd note in this crowd was provided by three horsemen who wore coats of mail and plumed helmets and carried shields and swords with cross-shaped hilts, like the Crusading knights of old. Even their horses were completely armored, and



AN OUTPOST OF LAW AND ORDER (SEE PAGE 658)

Until recent years, the village in the beautiful oasis of Beni Abbes was subject to destructive raids from nomadic pillagers, but the French have established a military post here which has very effectively put a stop to such activities.

we wondered not a little as to how these reminders of medieval Christianity had come to Central Africa (see illustrations, pages 671 and 672).

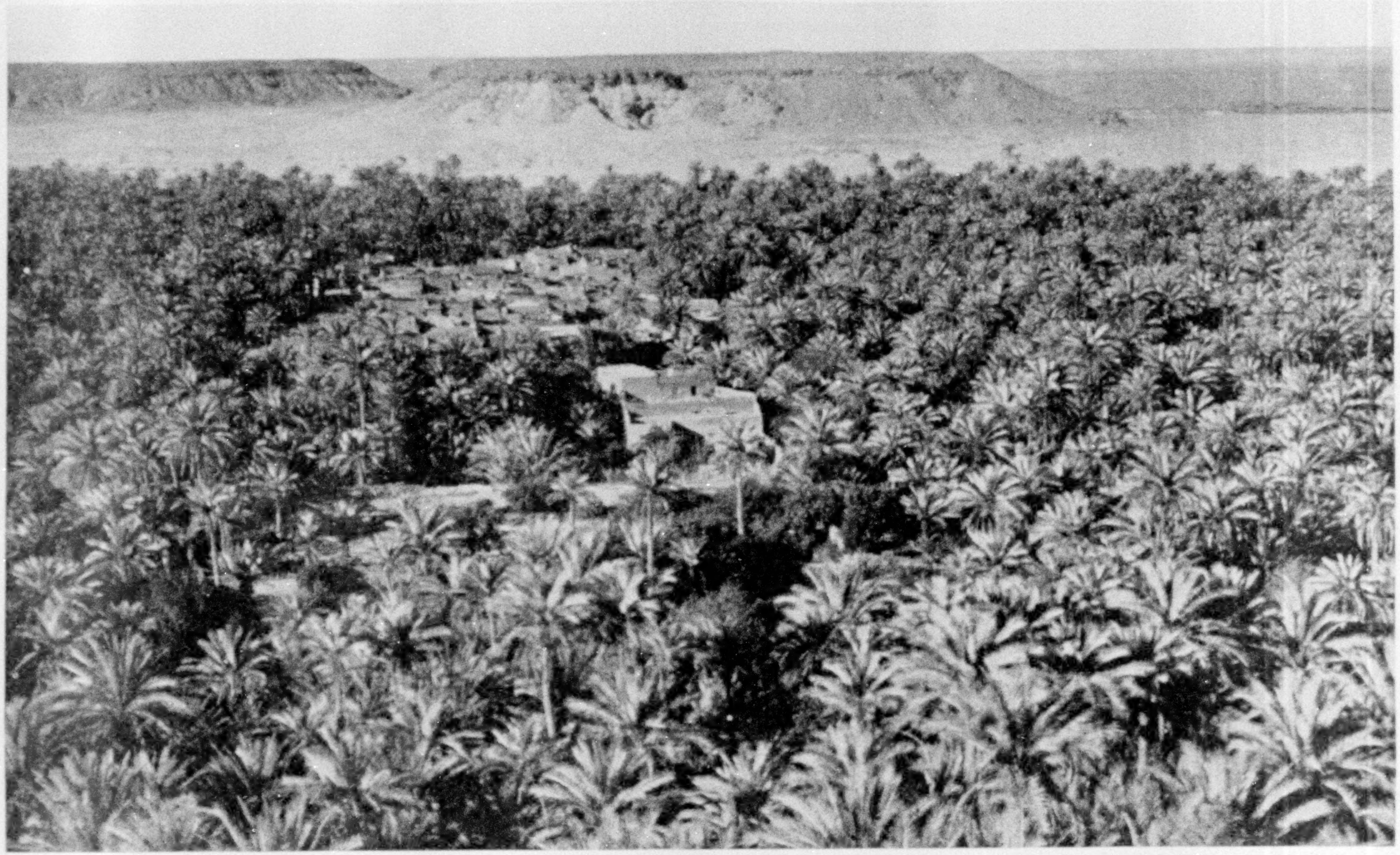
We left the Niger at Niamey and skirted the border of British Nigeria.

### WE ENCOUNTER A HUNTER WHO DISGUISES HIMSELF AS A BIRD

At Dosso we came across a hunter disguised as a bird. From a piece of wood he had carved a bird's head and neck, feathered it, and supplied eyes and an open beak. He placed this device around his forehead and went into the bush on all fours. Moving slowly and stopping at times to peck at the ground or to examine his surroundings, just as a real bird might have done, he was able to approach close enough to birds and hares to kill them with a stick (see page 673).

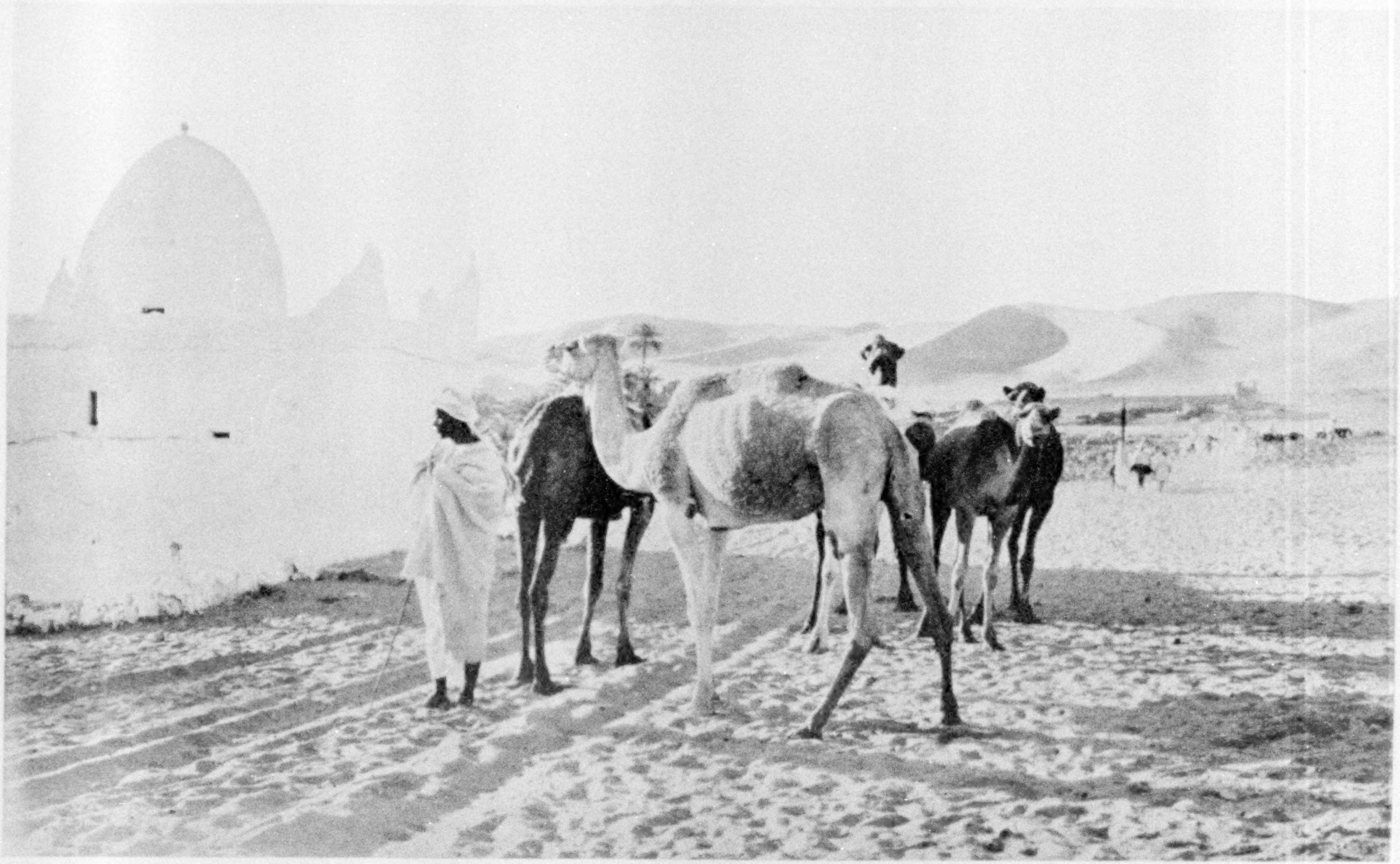
Once, between Dosso and Tessawa, we drove all night to gain time. One of the cars was running a few hundred yards behind the rest, and as it entered a rather large open space a gaunt hyena jumped out before it into the road. The driver immediately stopped his engine and switched on his electric searchlight, focusing it on the snarling beast in front of him.

The hyena, completely blinded by the

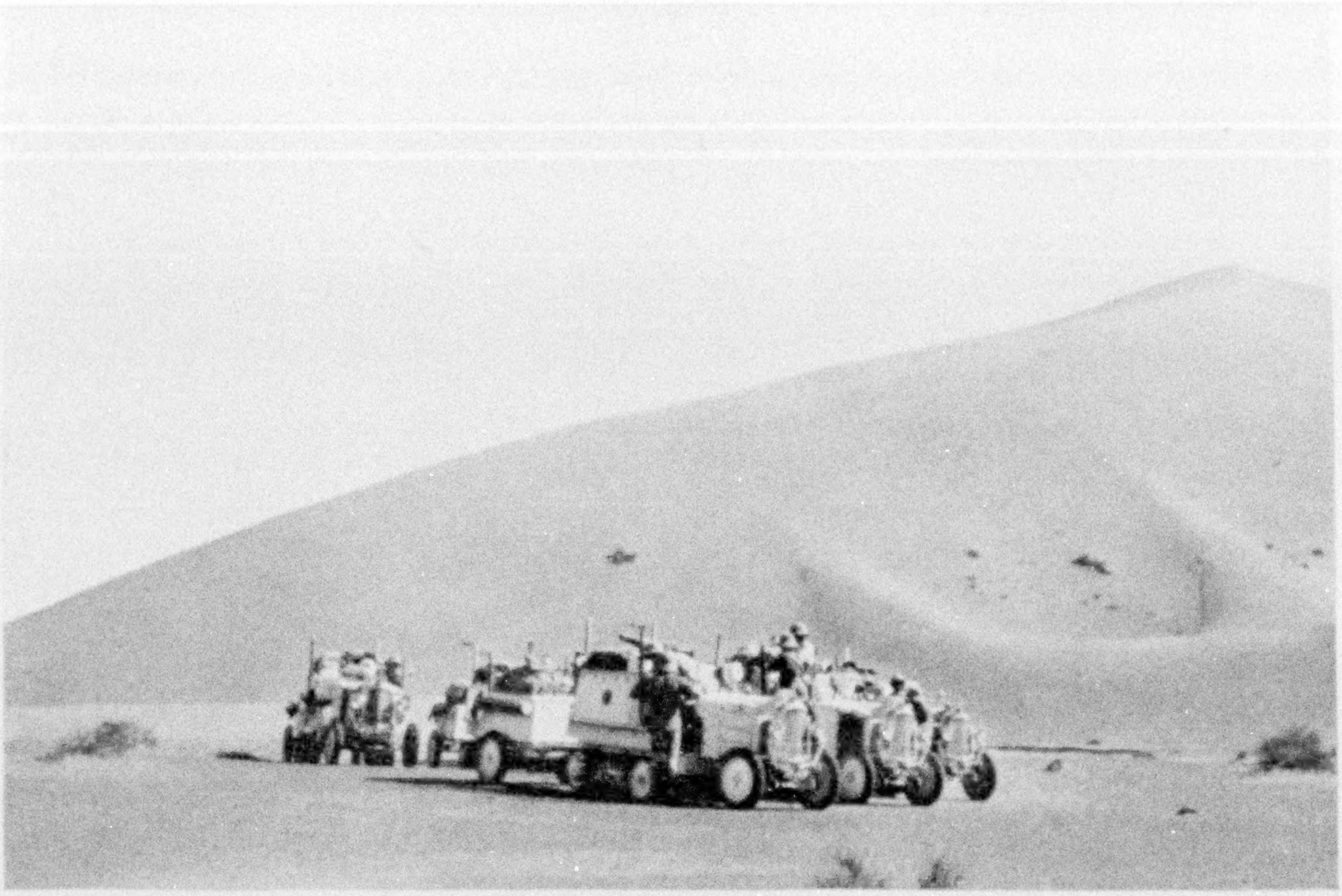


A RIVER OF VERDURE BETWEEN MAJESTIC SAND HILLS—THE OASIS OF BENI ABBES

This is one of the most magnificent of the Sahara oases. It is located in the bed of the Wadi Saura, and its imposing palm trees nearly hide the native town which nestles among them (see text, page 652).



THE EXPEDITION MEETS FELLOW TRAVELERS ACROSS THE SANDS OF THE SAHARA

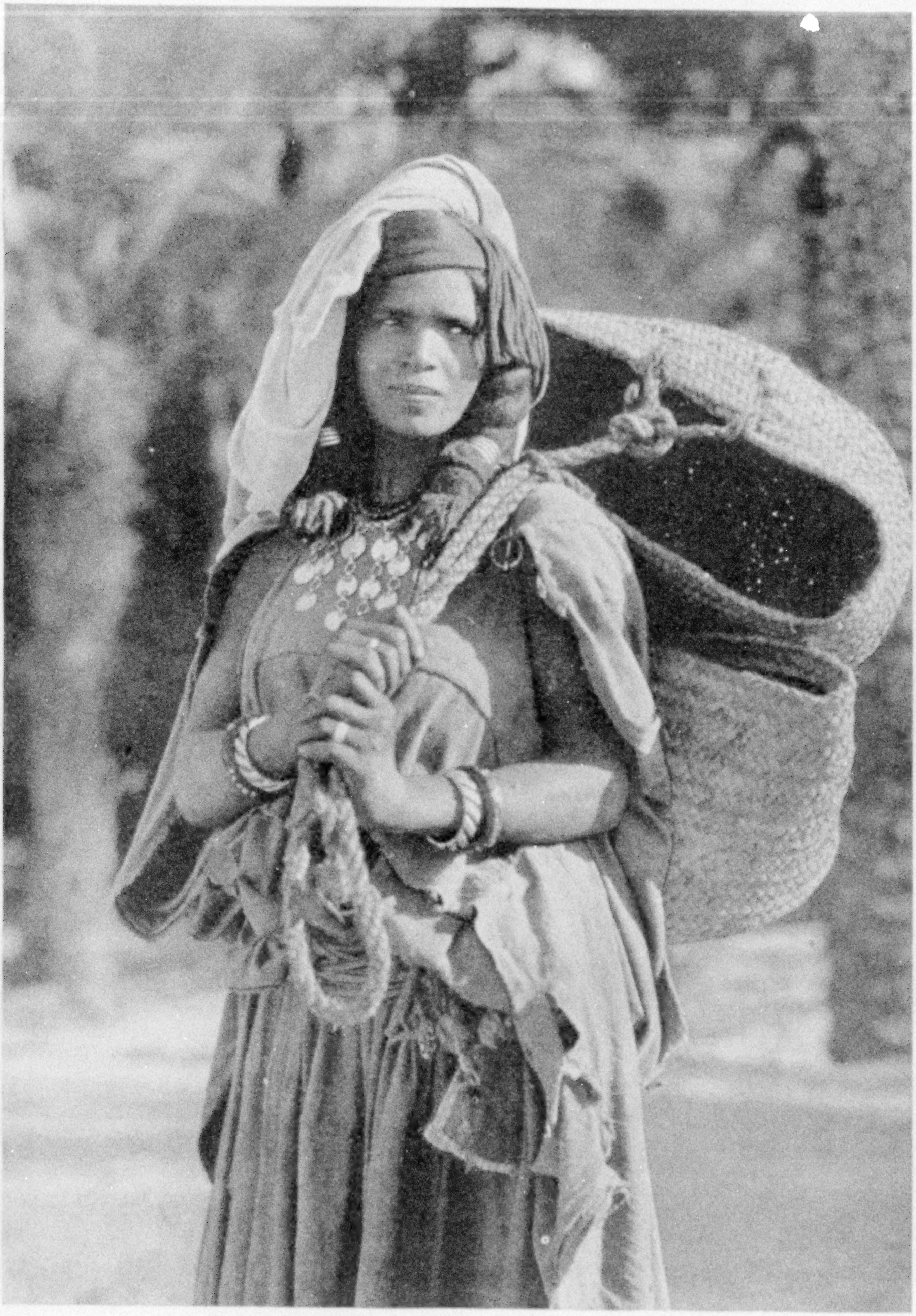


A LAND OF ETERNAL THIRST—THE TANEZROUFT

The Expedition traveled for more than 300 miles across this barren waste without finding any trace of water. A region of sand hills and plains, with frequent rugged outcroppings of rock, it has been referred to as the "country of mysterious disappearances" because of the many travelers who have perished without trace in its terrible sandstorms.

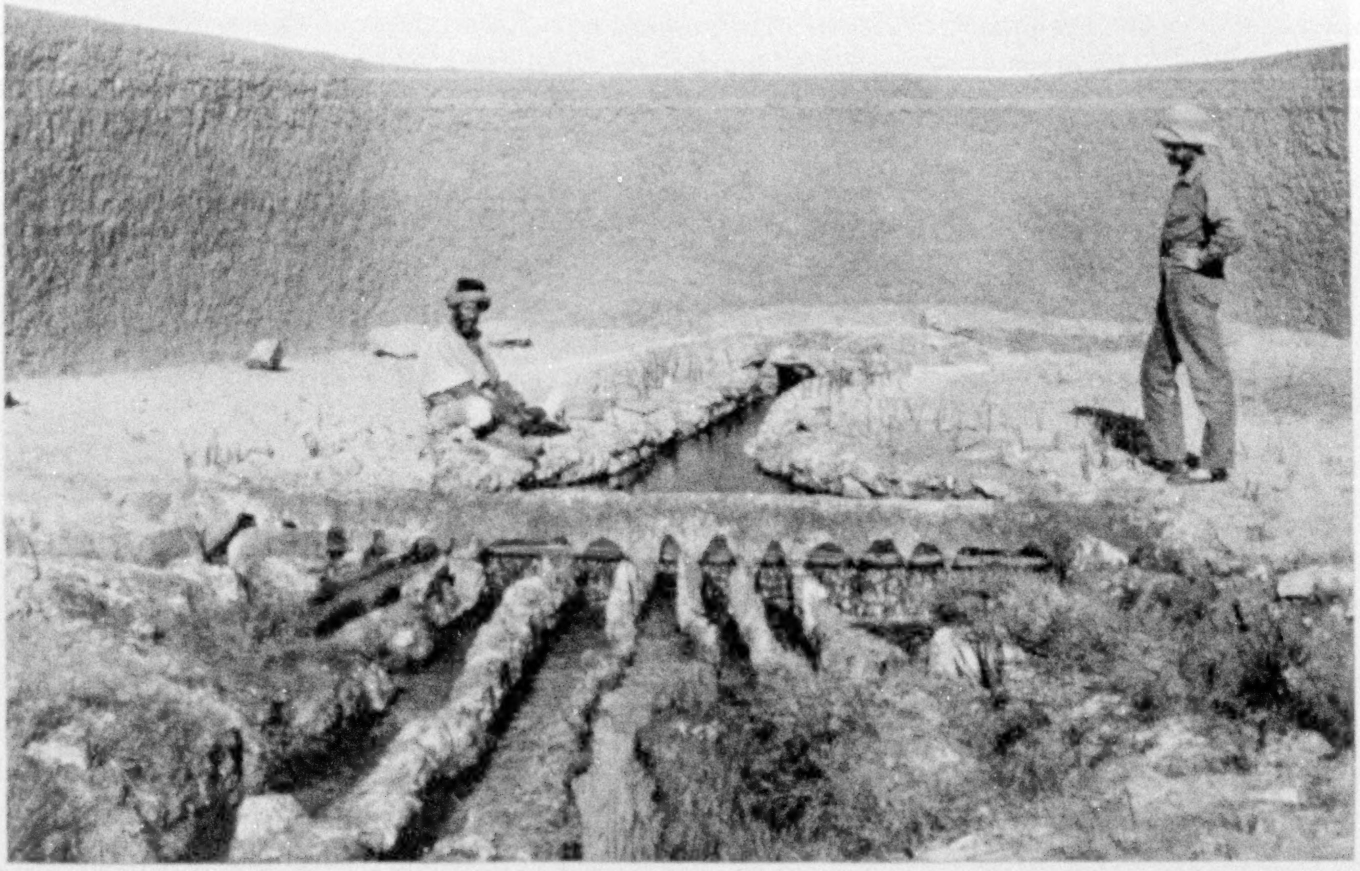
THE SAHARA CLAIMED HIM FOR HER OWN

Caravans crossing the Tanezrouft sometimes miscalculate their water supply or the speed of their camels and often atone for their error with their lives. M. Haardt's party came across several skeletal remains of those who had died from thirst (see text, page 653).



A PROUD DAUGHTER OF THE DESERT

The Harratines are black Saharan Berbers, resulting from an early crossing of Berbers and Sudanese Negroes. They are darker than many of the Negro races, but have all the handsome Berber features and form and are a very proud people.



DESERT IRRIGATION

To lead water from the wells and occasional streams found on the desert, small trenches are dug, which carry the life-giving fluid to the roots of the date palms and other plants. The main trenches are frequently covered over to check evaporation.

dazzling light, stood motionless, its eyes glowing like balls of red fire in the darkness, and it was the work of only a few seconds for M. Poirier to put a bullet squarely between them.

### SULTAN BARMOU BOASTS 100 WIVES

Under the escort of 3,000 of Sultan Barmou's Hausa riders, we arrived at Tessawa amid the noise of tom-toms and trumpets (see page 675).

Barmou is one of the few living men who can claim the possession of 100 wives. He was once a very powerful prince and still maintains a considerable retinue. His wives do nearly everything but breathe and eat for him, from the time of their earliest morning greeting, when they prostrate themselves in the dust, till the end of the day, when they dance for their lord before he retires.

This mighty chief showed us many special favors, even allowing our photographer to visit his harem and obtain motion pictures of the daily life of his interesting household (see page 665).

At Zinder, where we stayed for several days, we observed an interesting ceremony of the Peuhl tribe, known as flagellation. It is a ritual performed by youths who have reached the age of manhood and who wish to take unto themselves wives.

Before a numerous gathering of women, who sing and clap their hands to the rhythm of tom-toms, the aspirants approach, naked to the waist.

An old man carrying a flexible branch strikes each youth a severe blow on his chest or back, while another venerable member of the tribe crouches at the feet of the candidates to watch their movements.

### A STRANGE REGATTA ON THE KOMADOUGOU

Ten or a dozen blows are thus delivered on each boy's bare skin, but he must not move or exhibit any sign of pain, and during the whole of the ordeal must sing a pæan of praise. If he passes successfully this severe test of fortitude he is considered a man among men and is granted all the rights and privileges of his new position (see page 679).

A MUSICIAN OF BENI ABBES

Major Bettembourg, who had been in this part of Africa before, arranged a treat for us when we came to the Komadougou River. He organized a series of unique water races among the natives.

The contestants were divided into couples (a man and a woman), and each pair supplied with a device consisting of two immense empty gourds joined by wooden spars. They sat across the spars back to back, with their feet in the water, and at a given signal arms and legs started in unison and moved with great rapidity, sending the strange craft quickly across the stream (see illustration, page 682).

Barring collisions with crocodiles or hippopotami, this is great sport for the participants and affords thrills and laughter for the spectators.

The caterpillars having skirted the southern end of Lake Chad to Fort Lamy, we boarded the steamer *Léon Blot* for a cruise. This little vessel has been traveling on Lake Chad for more than 20 years, but it hasn't yet learned not to roll and pitch. It is given frequent excuse to do this because of the extreme shallowness of the lake and the consequent ease with which the winds lash the water into whitecaps. We rocked heavily in a choppy sea, much to the discomfiture of some members of the party.

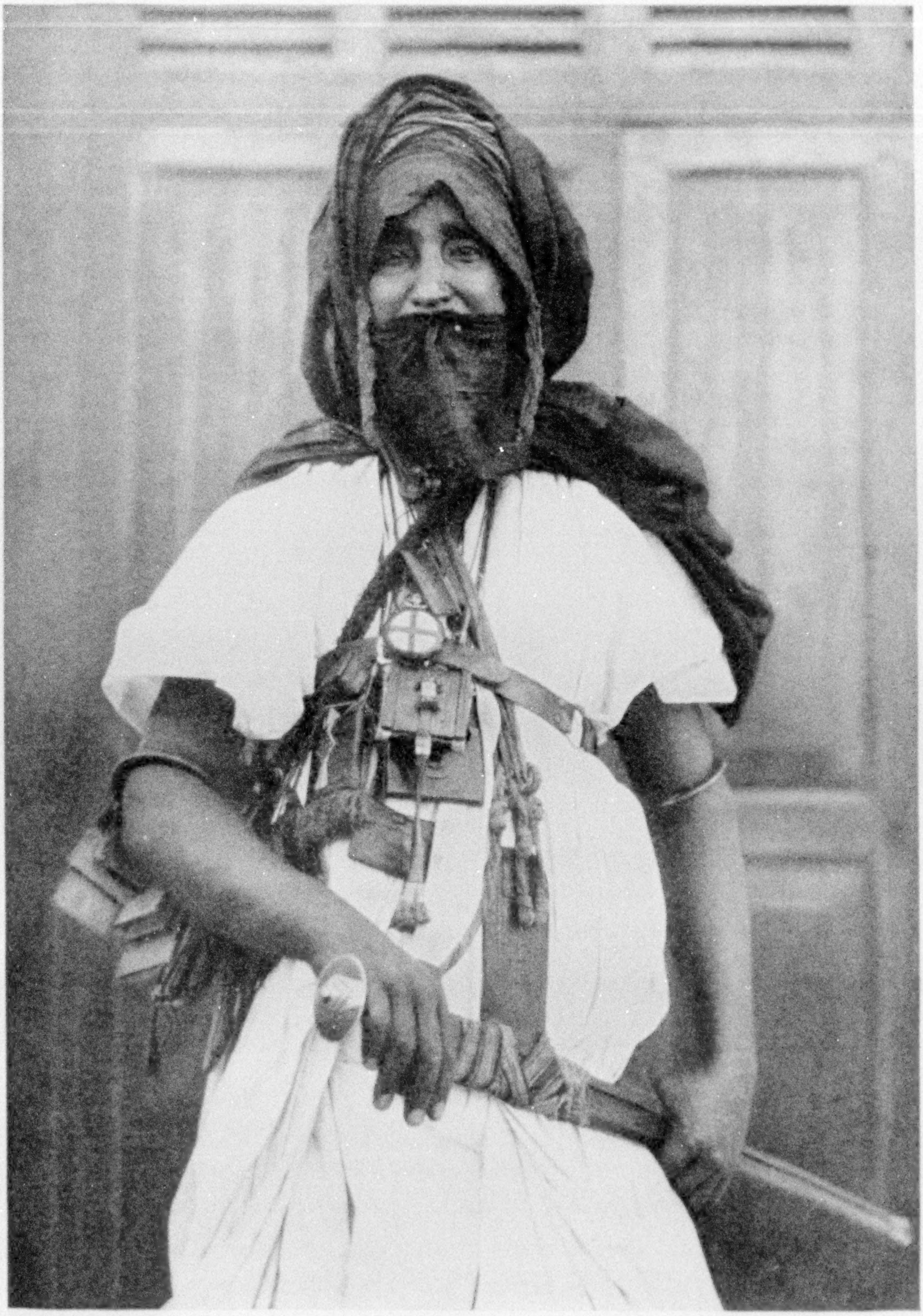
### INTO THE REGION WHICH JUSTIFIES THE SOBRIQUET DARK CONTINENT

Except on the south and southeast, the lake is bordered by swamps and its shores studded with islands, some real and some floating. The real ones are inhabited by a pastoral people known as Boudoumas, who are said to be descended from the Peuhls or Kanembou.

The floating islands are of papyrus or ambach, an extremely light wood used extensively by the natives for boat-building, both because of its lightness and because of the ease with which it can be worked.

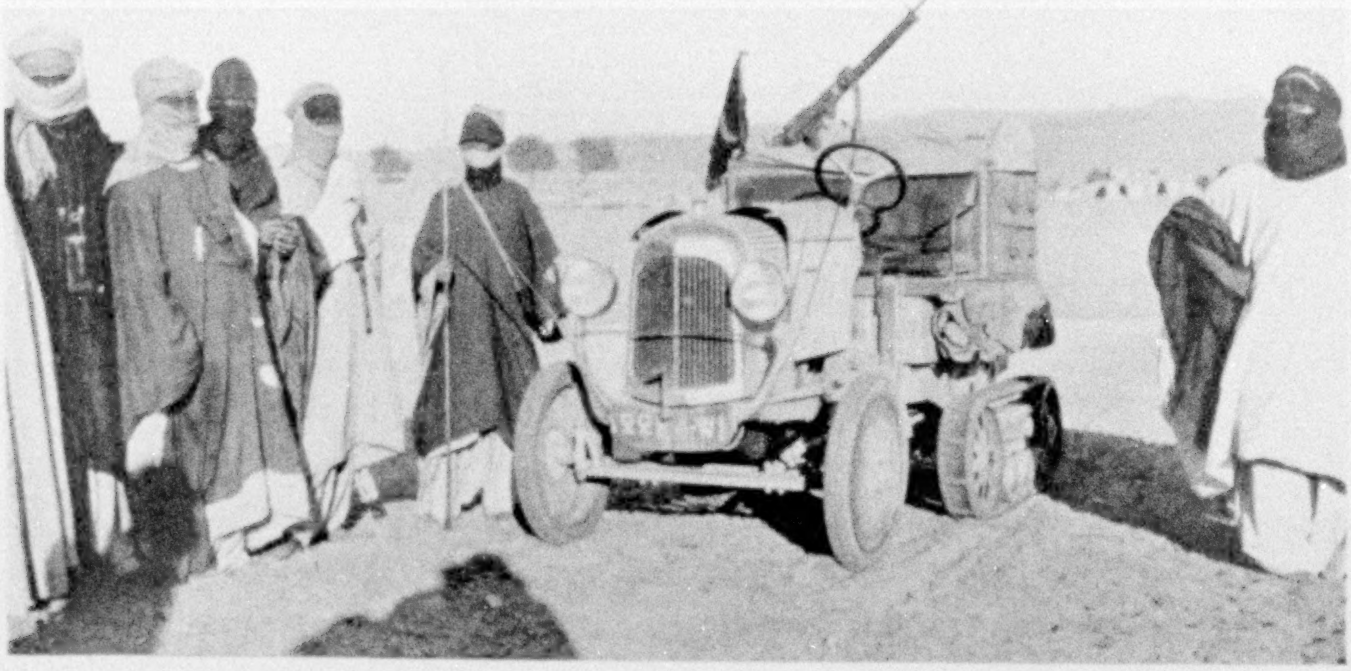
At Mogorom, on the banks of the Shari, which flows into Lake Chad from the southeast, we passed from Mohammedan territory into a region of fetishism which gave to Africa the sobriquet Dark Continent. Here clothes are not considered a necessary part of a native's equipment, men and women alike disdaining them.

The Mazzas, living in the region around Mogorom, have a hideous custom of muti-



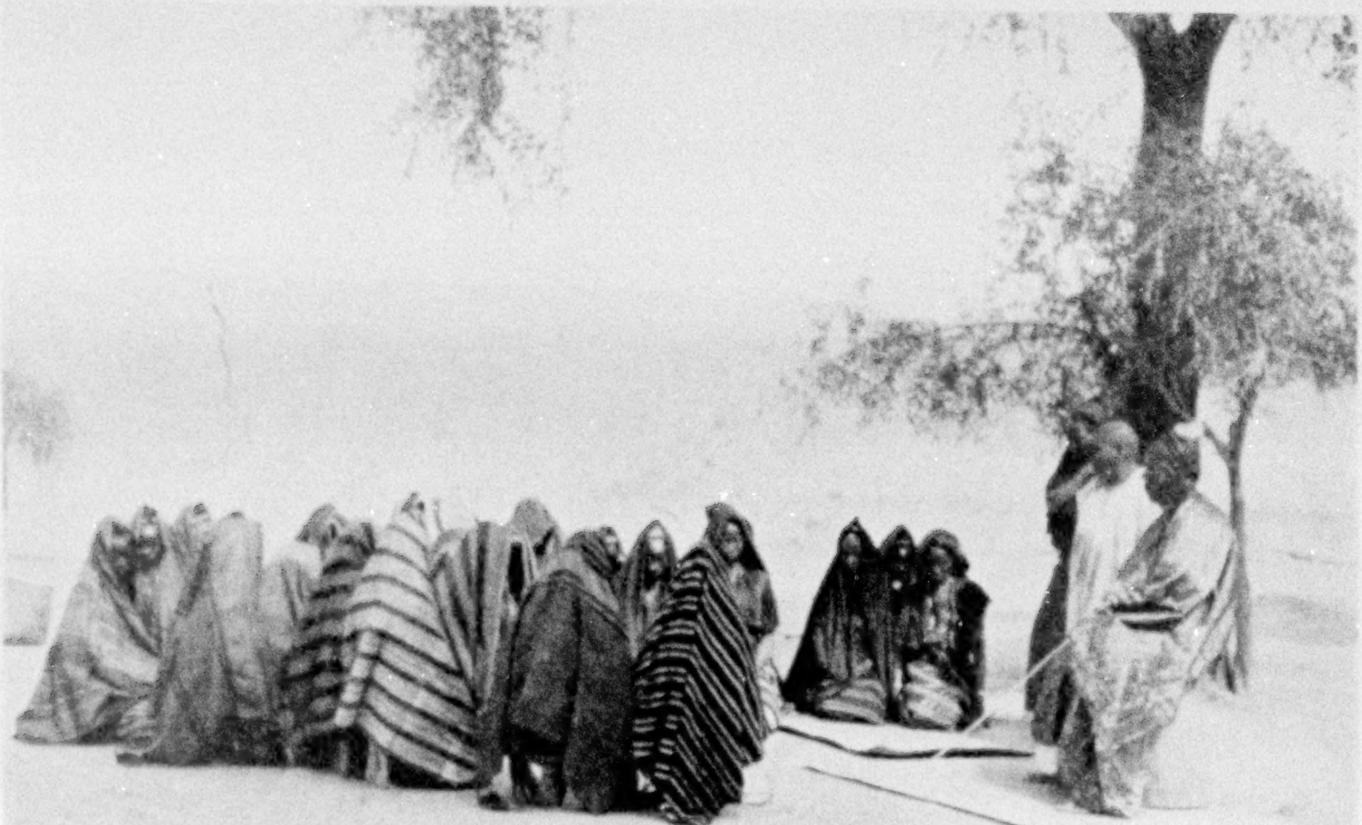
NGOUNA, CHIEF OF THE RIVER-TUAREGS: BUREM, FRENCH SUDAN

The most striking feature of a Tuareg tribesman's costume is the veil, which is worn across the lower part of the face. It was probably adopted originally in order to protect the lungs from the dust and sand of the desert, but there is also a legend to explain the custom (see page 656).



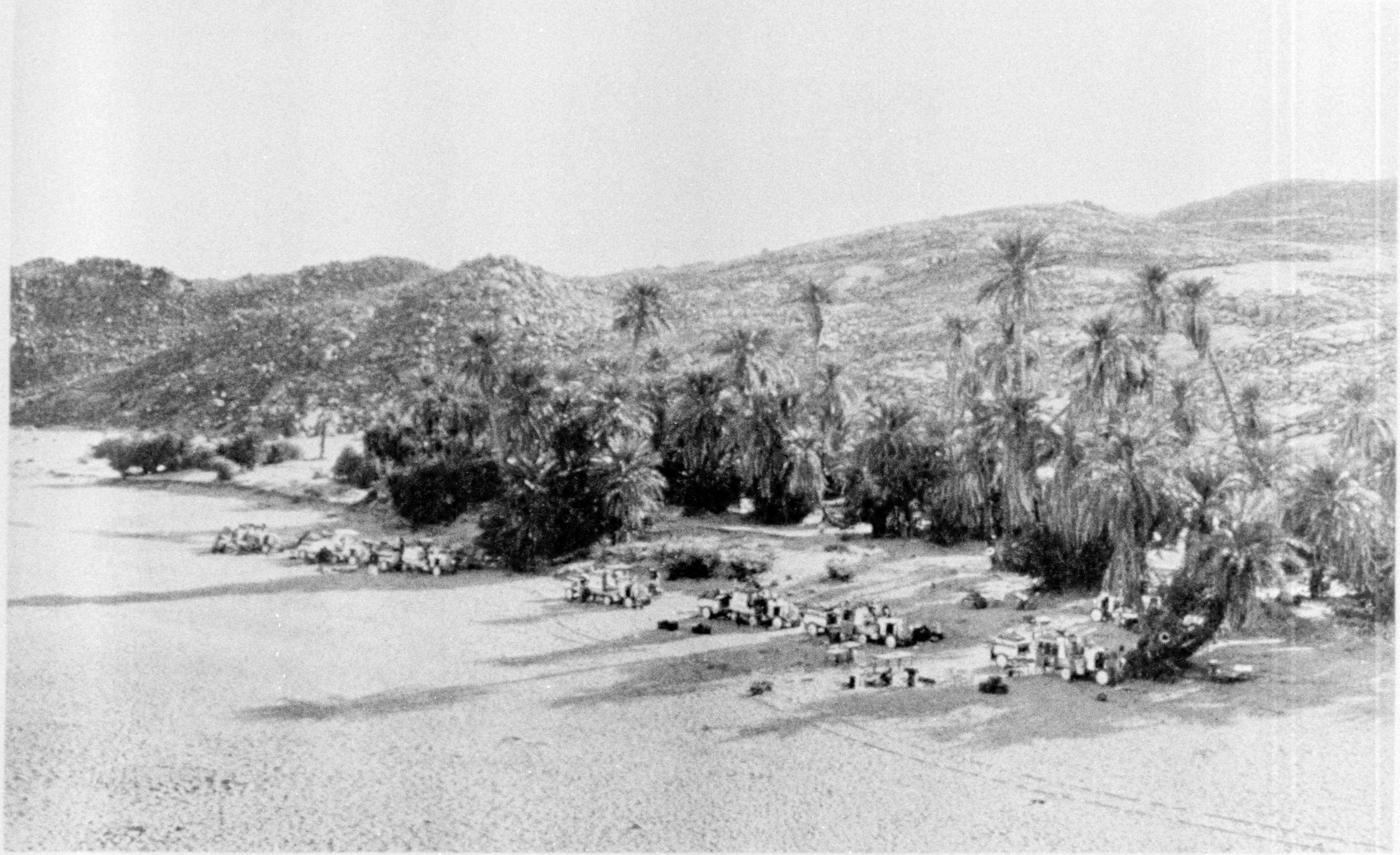
VEILED MEN OF THE DESERT-TUAREGS

Contrary to the Arab custom of veiling their women, among the Tuaregs the men conceal their faces, while the women's features remain uncovered (see, also, page 664). These fierce and fearless tribesmen have given the French much trouble.



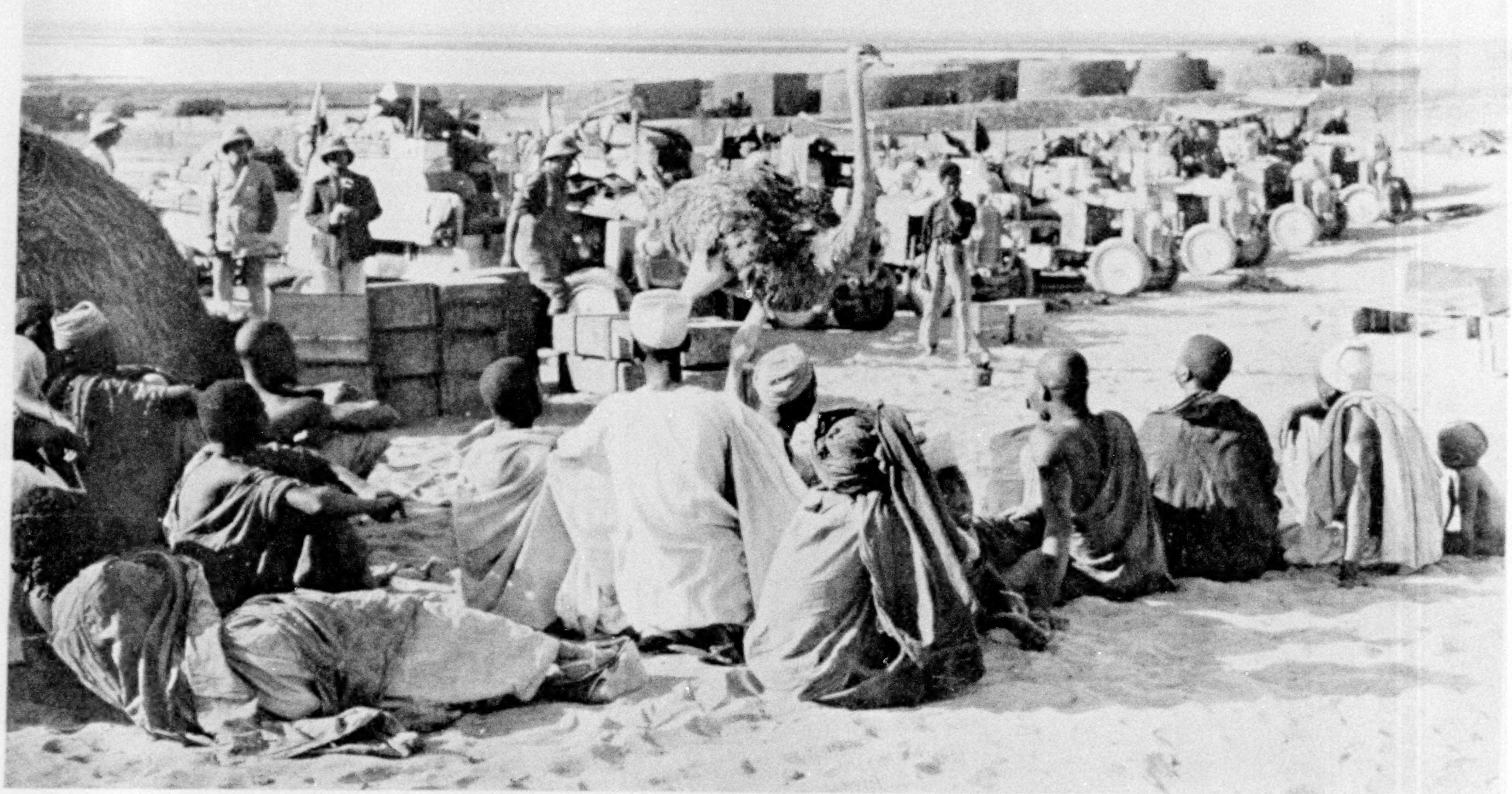
SAYING "GOOD MORNING" TO THEIR LORD AND MASTER

The first duty of the day in the household of the Sultan Barmou is to fall upon one's knees and prostrate one's face in the dust (see text, page 662).



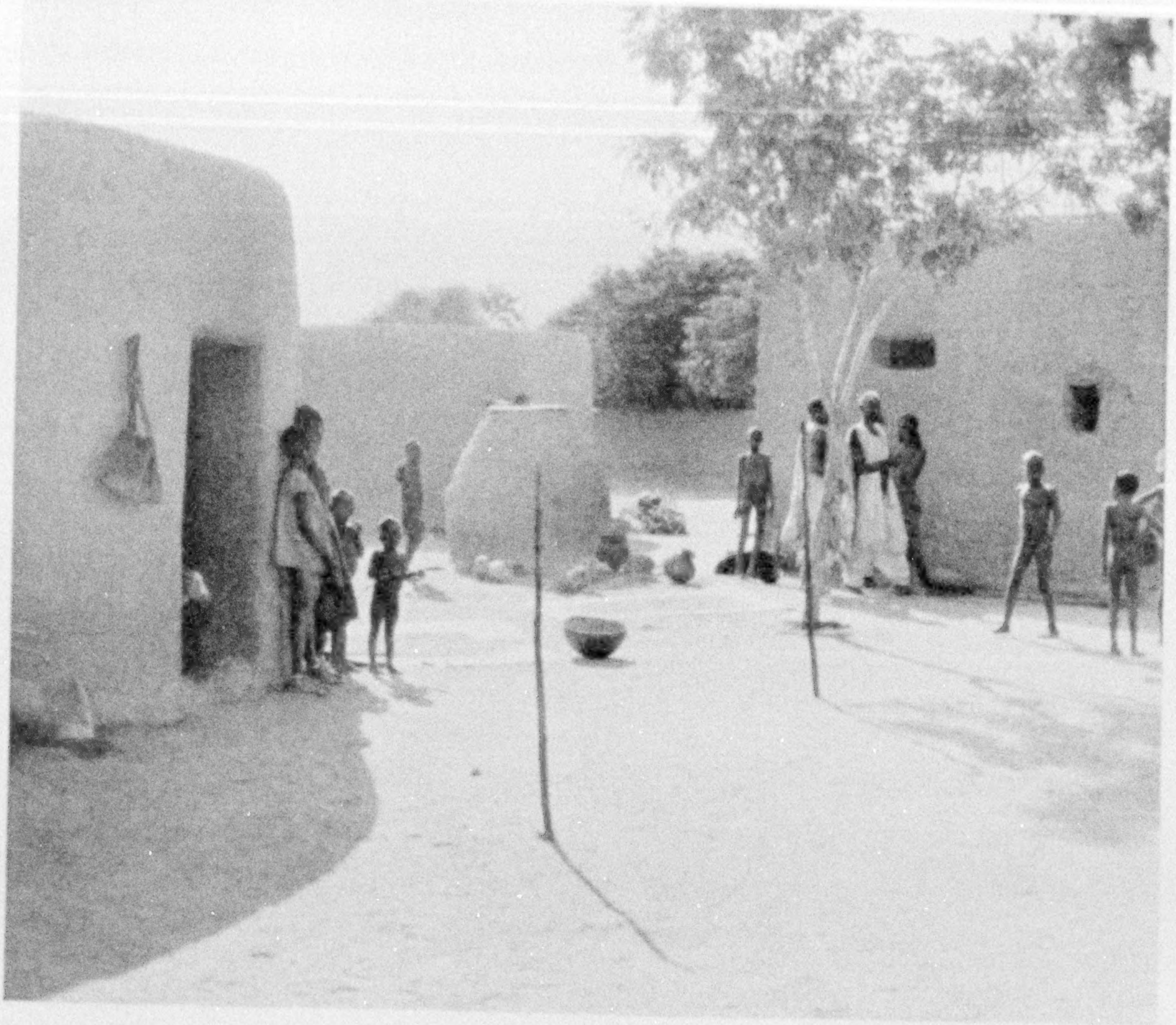
CAMPED IN THE OASIS OF TESSALIT AFTER THE ORDEAL OF THE TANEZROUFT PASSAGE

The palms of Tessalit are the first signs of life to welcome the traveler who has succeeded in crossing more than 300 miles of burning sand. During the day the explorers camped as they pleased, but at night their cars were arranged as a miniature fortress, to guard against possible attacks by robbers.



A TAME OSTRICH SURVEYS WITH WONDER THE EXPEDITION'S SUPPLIES: BUREM, AT THE END OF THE DESERT TRAIL

The population of this town, with the Niger on one side and the sands of the Sahara beyond, is made up of a mosaic of peoples. More than 60 languages and dialects are spoken in this region.



EARTH DWELLINGS OF A SEDENTARY TRIBE NEAR BUREM, ON THE NIGER

lating the lips of their women by piercing holes in them and inserting wooden disks. These disks are gradually made larger and larger until the lips are stretched to an almost unbelievable size and shape. A woman who is not thus mutilated is not considered a desirable person for a wife.

When one of these poor creatures eats she resembles a pelican. At each bite she must lift her upper lip with one hand and slip the food into her mouth with the other (see pages 686, 688, and 691).

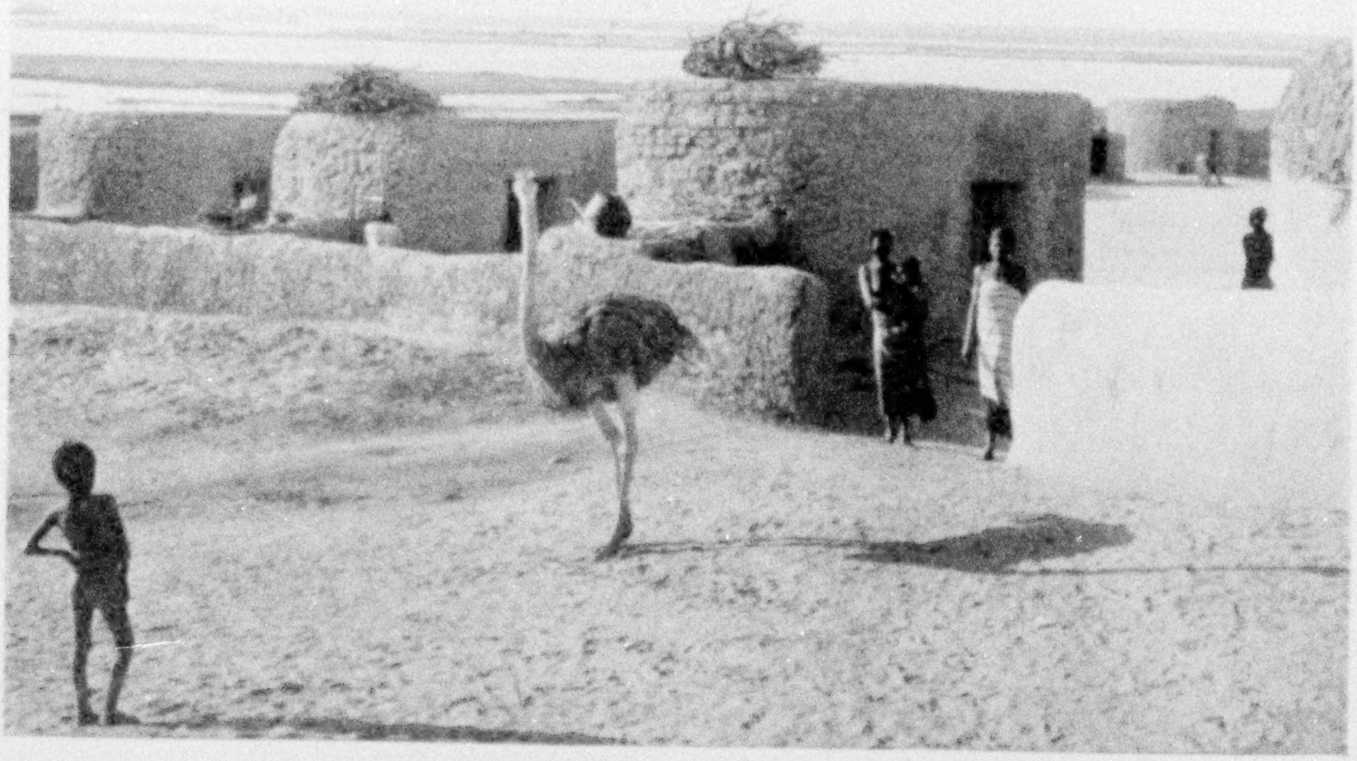
### A SECRET SECT THAT TALKS IN GUTTURAL COUGHS

A merry, noisy crowd surrounded our cars and began an informal sort of celebration, the men dancing on one side to the regular beat of tom-toms and the women on the other to the rather musical notes of the balafo, an instrument somewhat resembling the xylophone, made of pieces of wood stretched above gourds of various sizes and struck with small hammers (see page 697).

Near Fort Archambault we first came across the Yondos, a secret sect whose members are mostly of the Sara strain. Clothes are quite unknown to them, their only attire consisting of a thin strip of cloth and a bead belt. They paint their bodies with a sort of ocher clay, and adorn themselves with glass-bead necklaces, copper and iron bracelets, and an ostrich-plume headdress (see page 689).

Much of their time is spent seated in motionless dignity upon small stools, which they always carry with them. They communicate with each other by means of prolonged guttural coughs, which have a meaning known only to them.

There are several thousand of these Yondos, and their fellow-citizens regard them with a respect tinged with fear, although their conduct appears to be quite blameless.



TIRAILLEURS' BARRACKS, IN THE FRENCH SUDAN

The military post of Burem overlooks the broad stretches of the magnificent Niger, which, 1,500 miles from its mouth, is nearly a mile wide at this point. Considerable commerce finds its way down this great waterway from Timbuktu to the Gulf of Guinea.

Before we left Fort Archambault the natives organized a beauty contest for our benefit. Since they are among the handsomest people in Africa, the men being tall and well proportioned and the women slender and supple, this was quite a treat.

All of the maidens and young women who were to enter the contest were lined up—more than 500 of them in all. The two town chiefs, wearing black spectacles as a token of high rank and distinction, acted as judges and subjected the entrants to a severe scrutiny. However, the deciding factor which proclaimed the fairest beauty of Fort Archambault was her fine feet (see illustrations, pages 693 and 694).

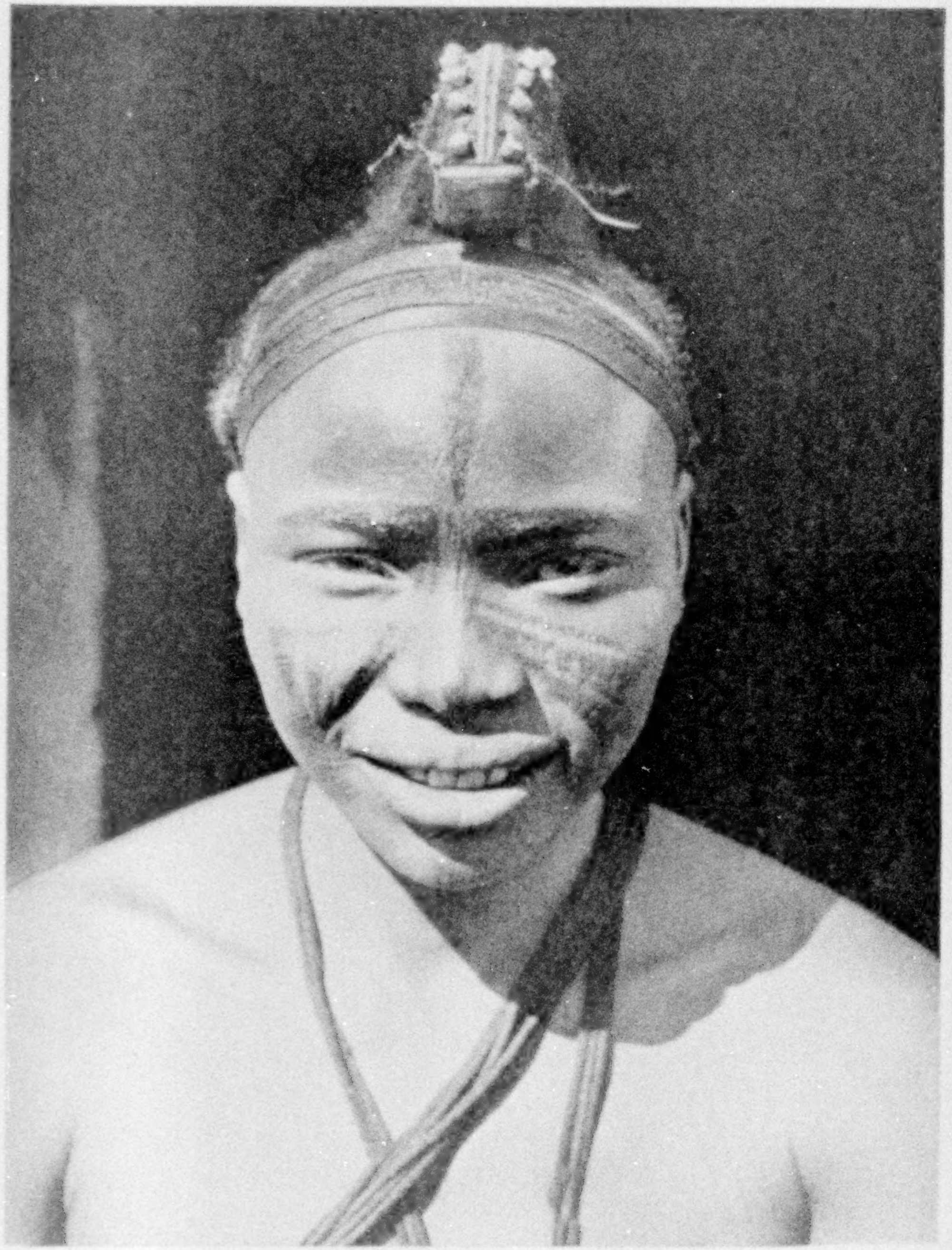
A native funeral provided an interesting spectacle at Bangui. The deceased was adorned in his finest and fullest attire—a belt, a necklace, and a feathered hat—and placed on a stool with his back resting against a stake. The whole population of the village gathered around him in a great circle, and musicians, or more properly noise makers, set up a bedlam of weird sounds.

The old folks sang praises of the departed, while a group of hired women mourners cried out and gesticulated in an apparent abandon of grief. Finally, the great circle broke up and formed two circles, one within the other, and each started a disorderly dance around the corpse to start him off on the right road into the Kingdom of Shadows.

### HUNTING ELEPHANTS WITH SPEARS

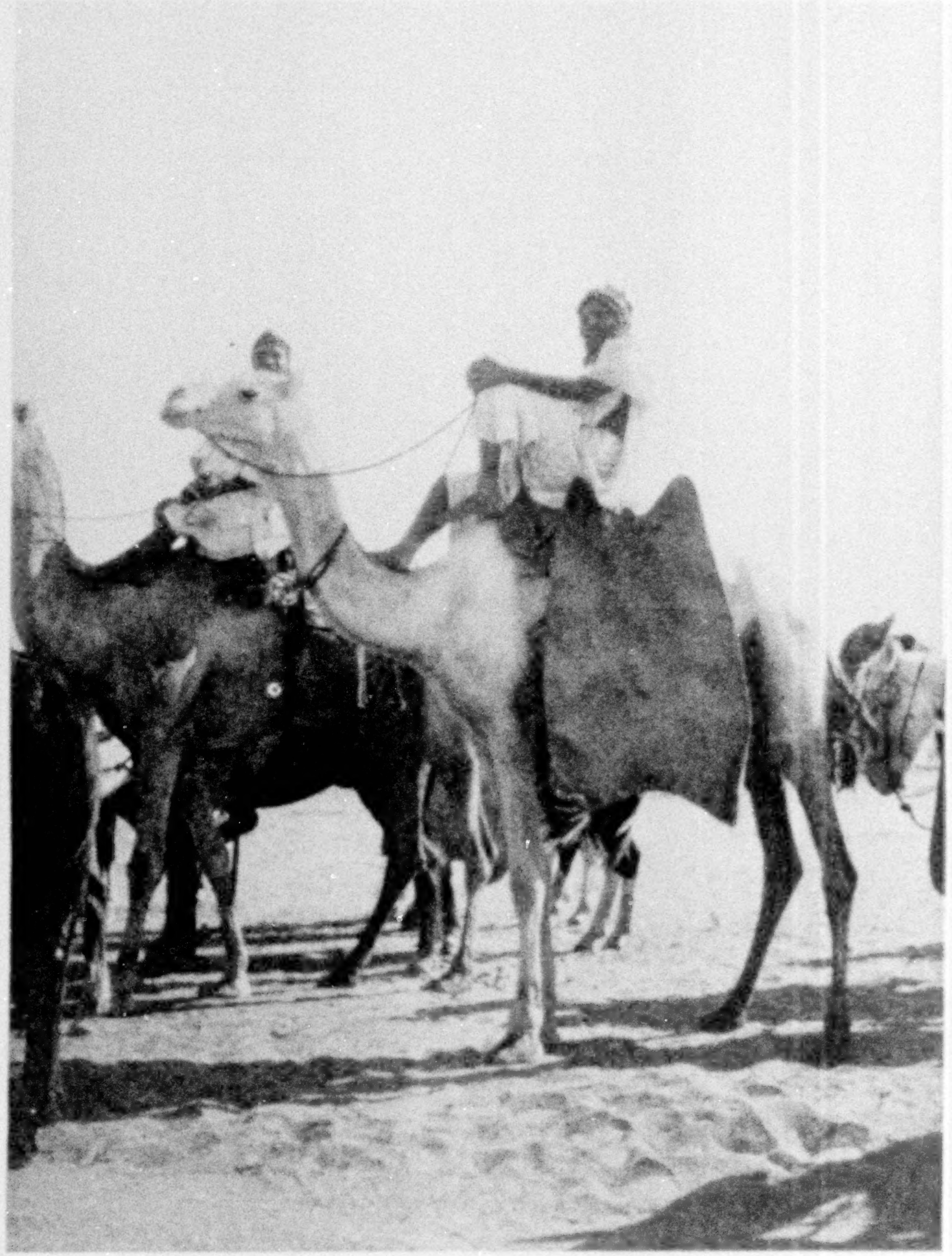
At Yalinga we were near a region that abounds with game, and since nearly half our long journey was completed, we decided to take advantage of the excellent opportunity offered to hunt and obtain some zoölogical specimens. We therefore headed north from Yalinga toward the Am Dafok swamp, where there was assurance of the presence of antelope, lions, and elephants.

Nor were we disappointed. We obtained the services of twenty expert hunters of mixed black and Arab blood who were absolutely devoid of fear. They were equipped with spears about 12 feet long, made of light wood, fire-hardened, and tipped with a sharp iron head, and



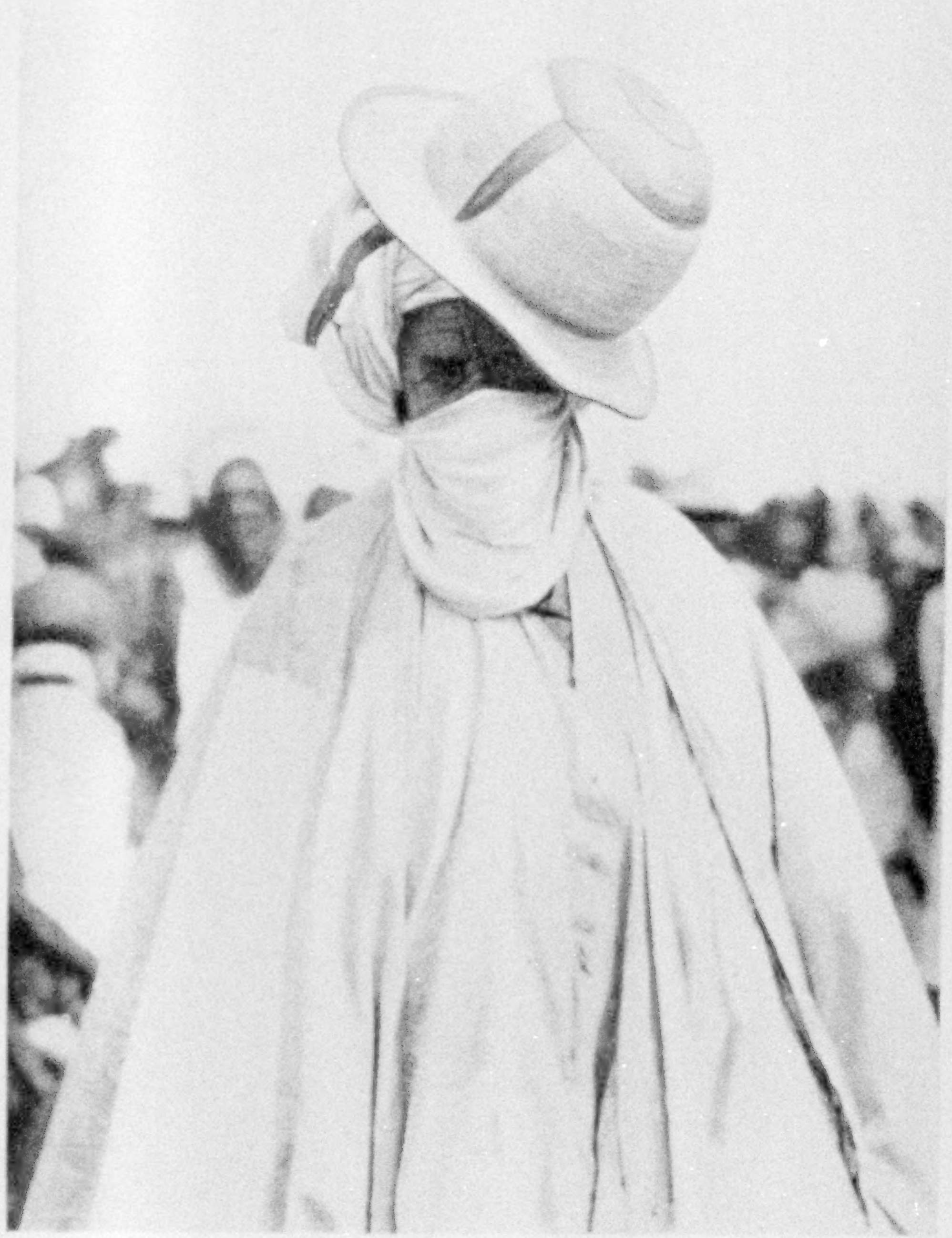
A PSYCHE KNOT ON THE NIGER

The women of many of the tribes of the French Sudan tattoo on their faces designs which serve to indicate their tribe or social status.



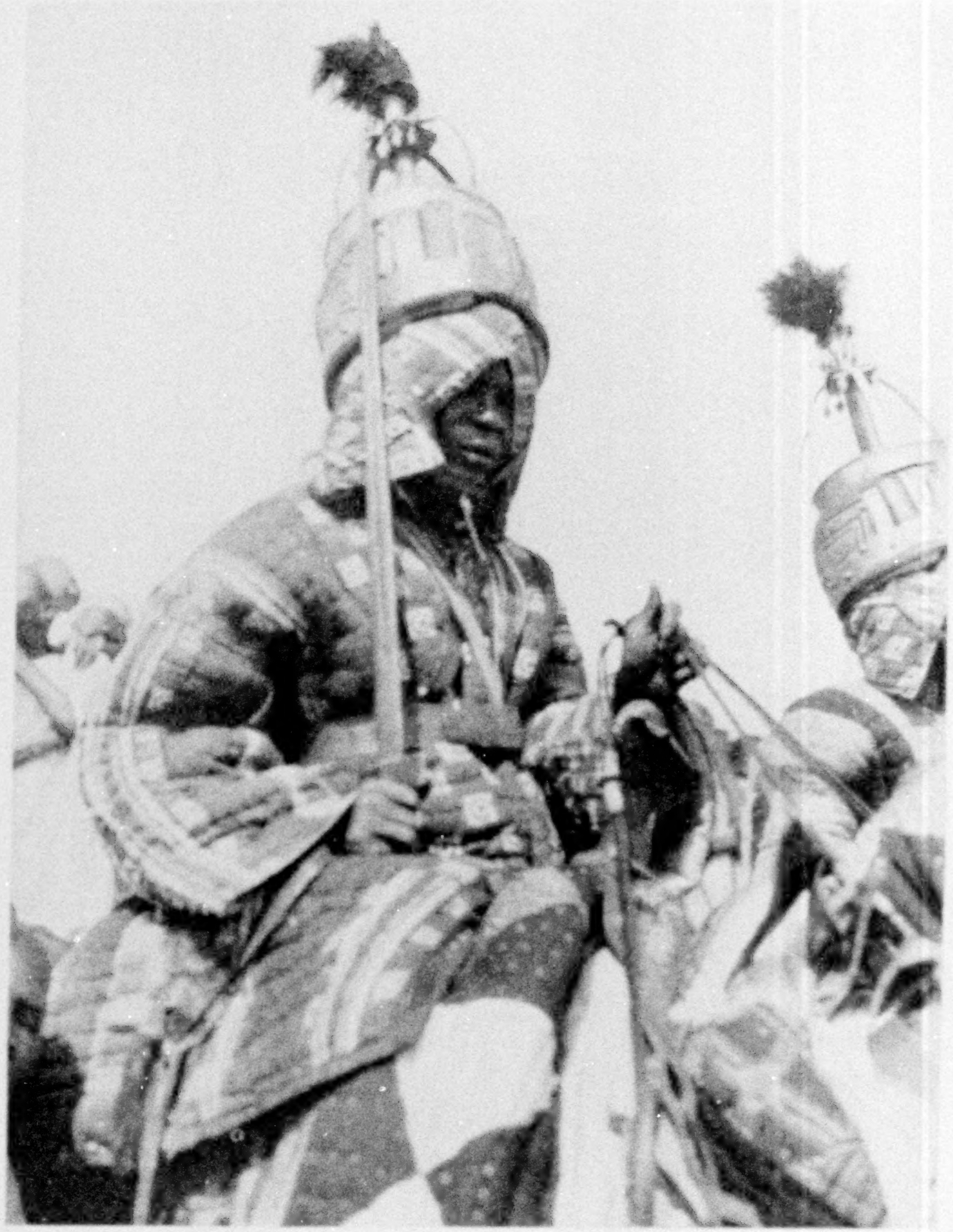
DESERT "MEN-O'-WAR"

The camel takes first rank among useful animals to the Tuareg. It is guided by a bridle attached to a ring in the nose.



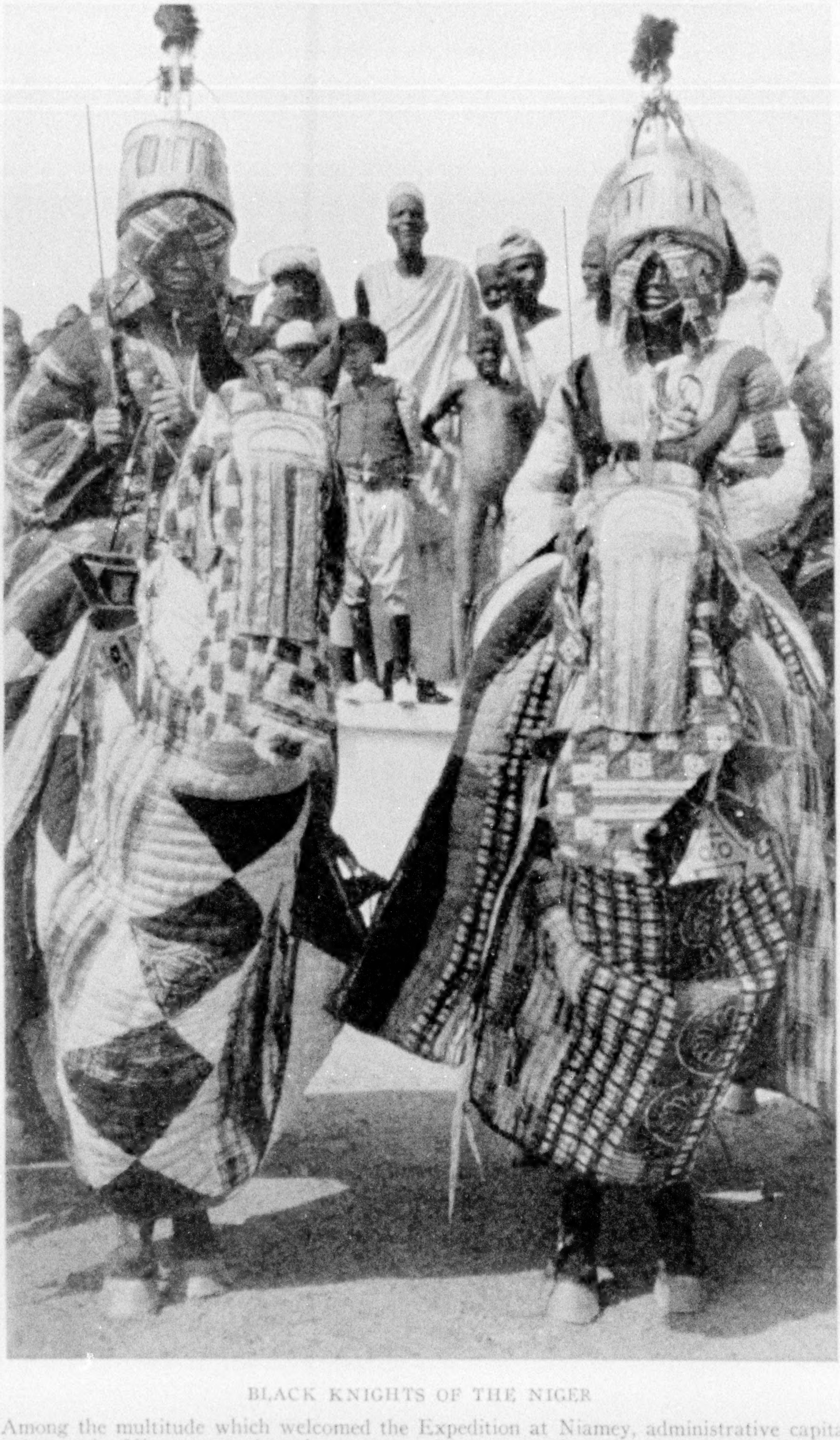
RISKING AN EYE ON THE CAMERA

The tilt of the hat gives rise to the suspicion that this native chief of Niamey is seeking to emulate styles set by Charlie Chaplin and London messenger boys.



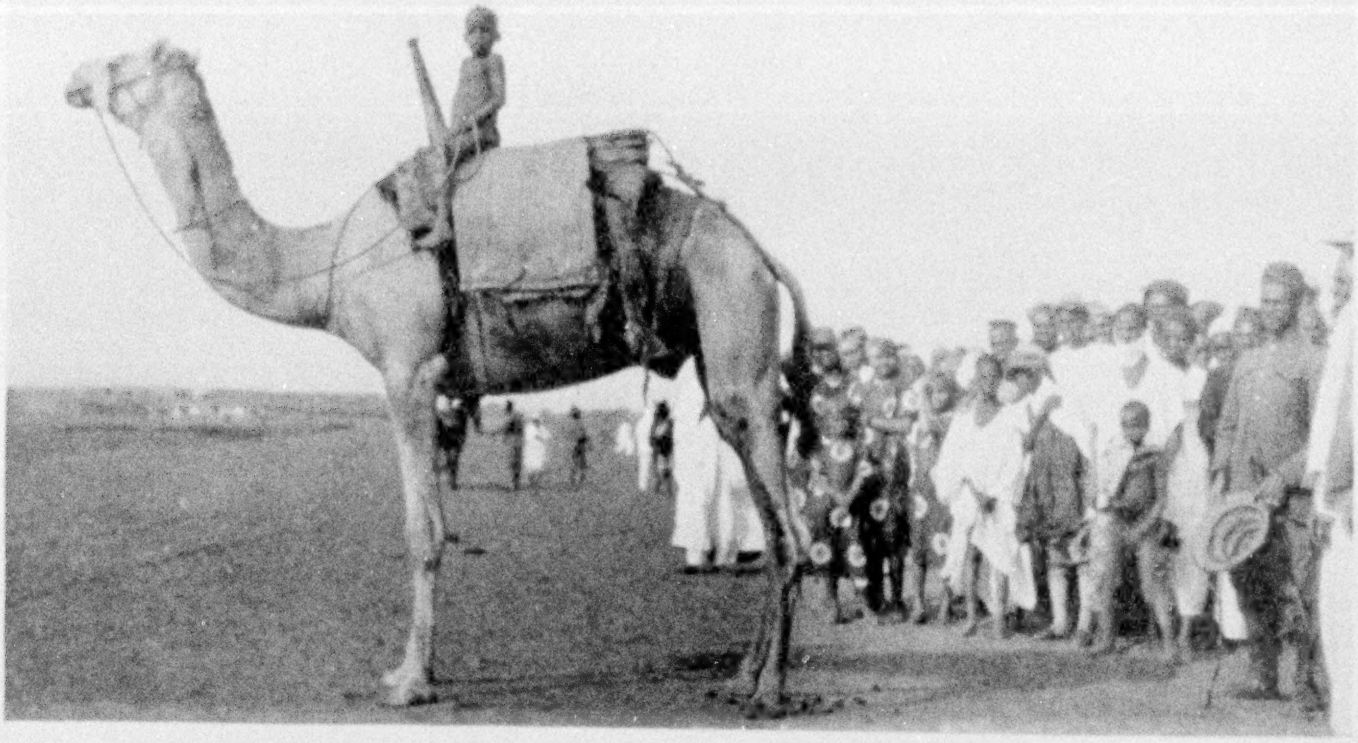
A NIAMEY HORSEMAN IN CRUSADER ACCOUTERMENTS

From whom did these Tuareg warriors copy the type of arms and equipment which were familiar on the battlefields of Palestine and Syria in medieval times (see, also, page 672).



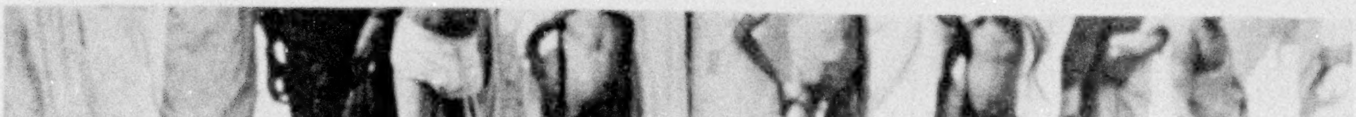
BLACK KNIGHTS OF THE NIGER

Among the multitude which welcomed the Expedition at Niamey, administrative capital of a district on the Niger, were three horsemen wearing coats of mail and having as headdresses feathered helmets. They carried swords with cross-shaped guards in their right hands and shields on their left sides. It was as if they had borrowed their style of equipment direct from Richard Cœur de Lion, the famous Black Knight of "Ivanhoe" (see text, pages 656-657).



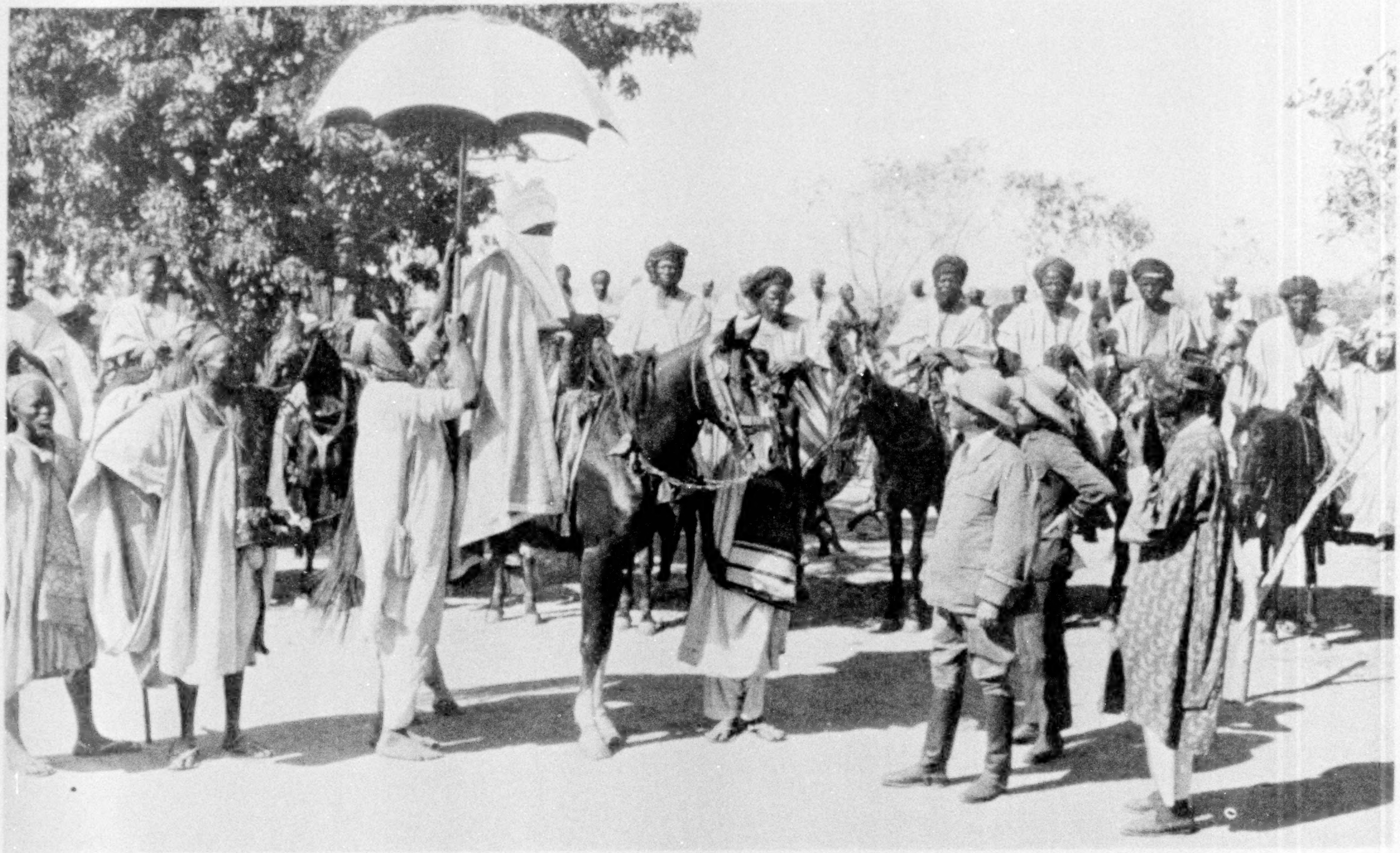
HIS FIRST LESSON

Niamey boys are born with the longing to join the camel corps.

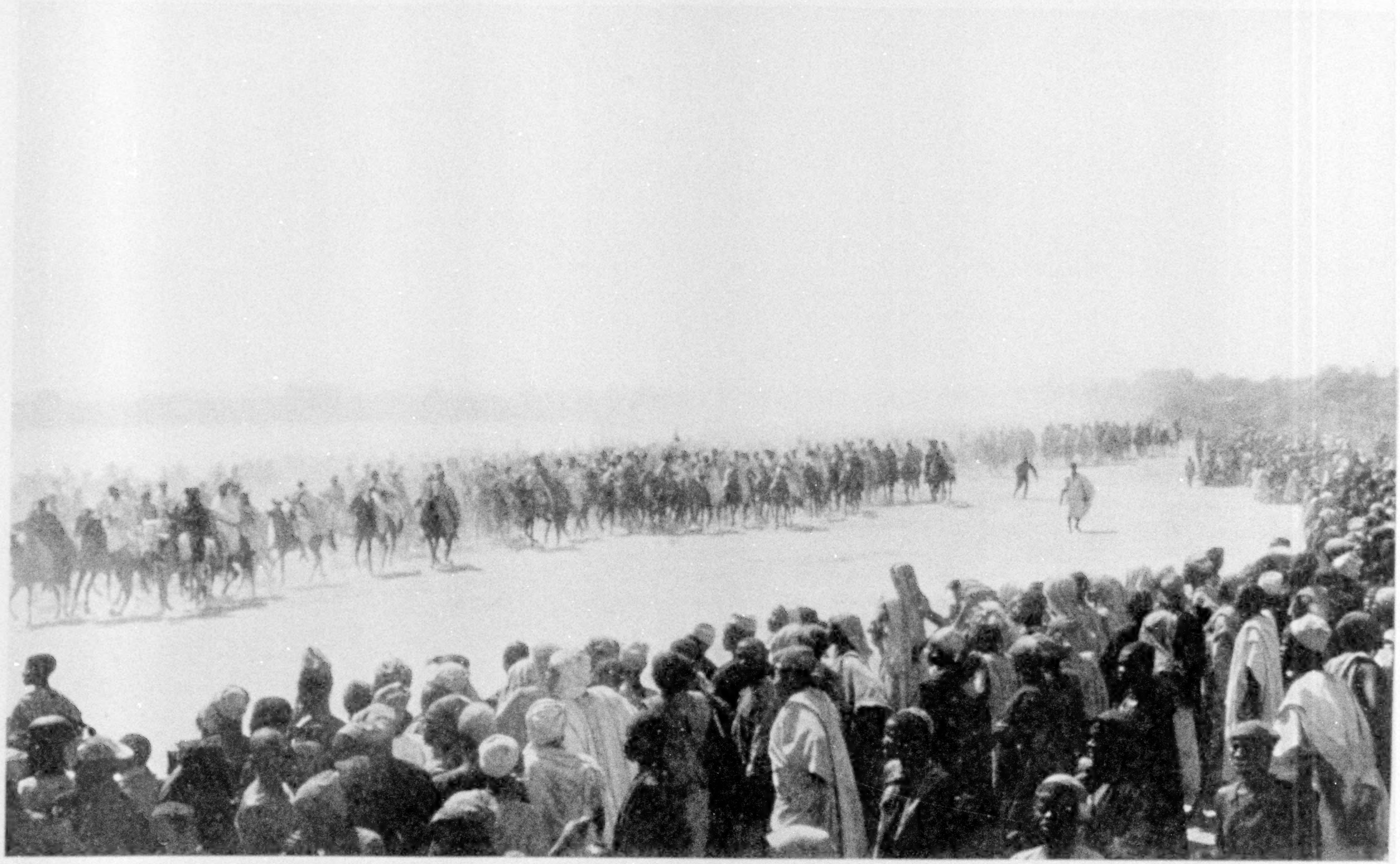


THE BIRDMAN

This strange device makes an effective decoy when skillfully used. The man crawls through the long grass so concealed that nothing but the bird head and neck can be seen. By stopping every now and again to look around or to peck at something on the ground, just as a real bird might do, the deception is so successful that the hunter is able to approach birds and small animals close enough to kill them with his stick (see text, page 657).

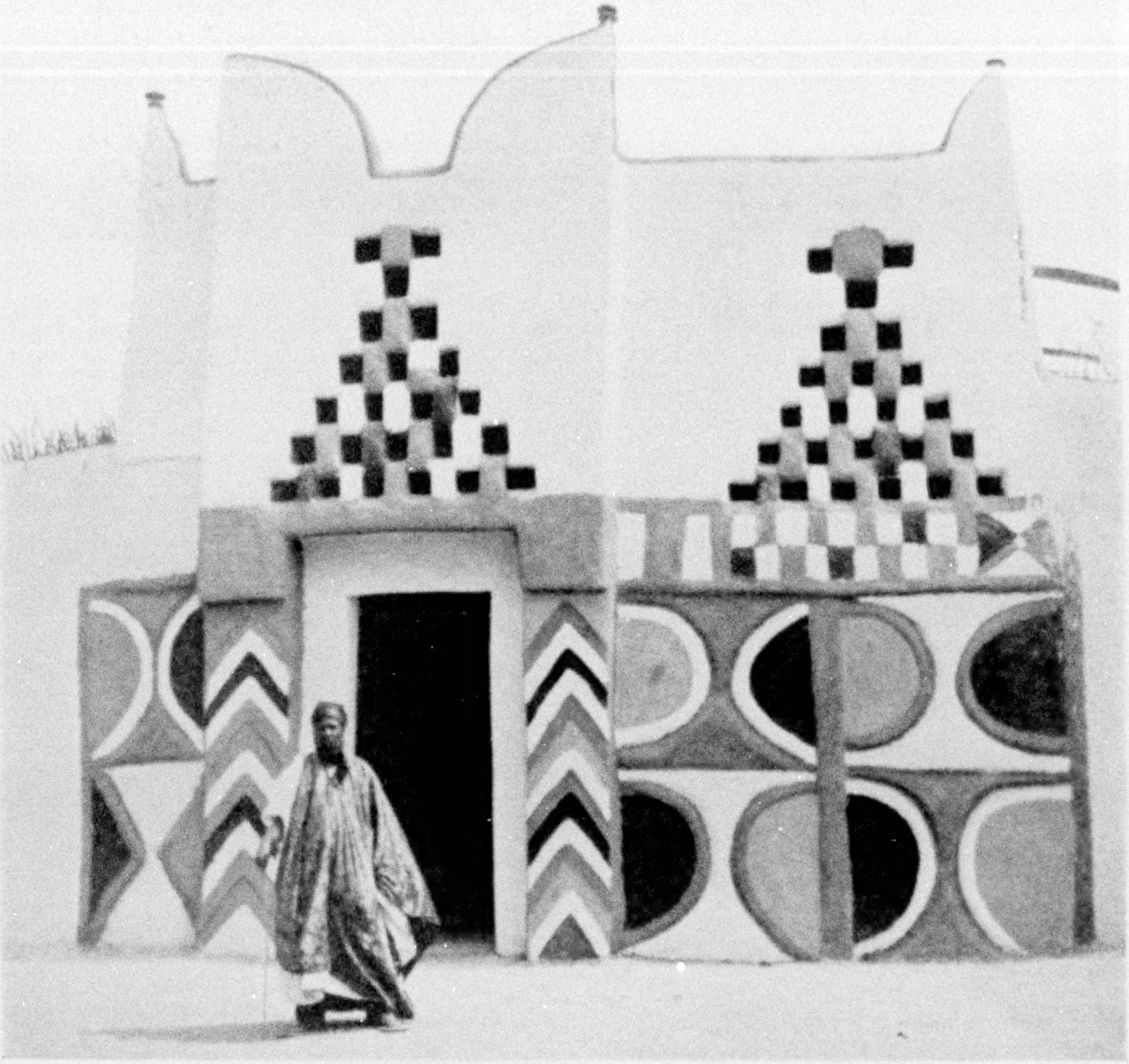


A MOUNTED NATIVE CHIEF OF MARADI, WEST OF TESSAWA, INTERROGATES MEMBERS OF THE EXPEDITION AS TO THE PURPOSE OF THEIR JOURNEY



HAUSA CAVALRY MANEUVERS

The Hausas are a people of mixed Arab and Negro origin, and about 200 years ago attained considerable power and importance. The chief reason for their military success was the existence of their large, efficient, and exceedingly mobile corps of cavalry. Three thousand of these excellent horsemen escorted the author and his party into Tessawa (see text, page 662).



SULTAN BARMOU BEFORE HIS PALACE IN TESSAWA

The decorative motif in this royal residence shows traces of Egyptian influence and is not unlike some of the designs used by the American Indians of our Southwest.

they well know how to use these formidable weapons (see page 698).

Taking advantage of the fact that elephants fear horses, these hunters, when they get near enough to the herd, go galloping among the animals. They select their victim and, riding madly at it, drive their spears into its flank with all their might, aiming at the heart. The animal usually escapes, but by following its trail they come upon it a day or two later, dead from loss of blood.

In all, our safari numbered 120 men. First came the native hunters, trotting briskly and scanning the horizon. These were followed by the European hunters, mounted, and each followed in turn by servants carrying rifles, ammunition, and personal luggage.

Other natives carried the cameras, food, and taxidermic supplies, while 12 laden asses brought up the rear, bearing our tents and other camping outfit. Seen from a slight elevation, the procession looked much like a huge snake spreading and contracting its coils among the bushes.

### THE JUNGLE IS VIBRANT WITH LIFE AT NIGHT

We pitched our camp between the Am Dafok swamp and the forest, in a grove of palm trees. Vultures and marabous flew about above the camp in a ceaseless and untiring round, approaching progres-

A HUNDRED WIVES TREMBLE AT HIS FROWN

Until the establishment of full European control in Central Africa, the Sultan Barmou of Tessawa was a powerful native prince, and he still maintains a numerous retinue. He extended many courtesies to the members of the Citroën Expedition (see text, page 662). The Sultan's son is standing.

sively nearer until they perched on the trees around us, and a few of the more audacious ones flew down to steal pieces of meat that our men had hung up to dry on near-by bushes.

Not far away roamed great herds of antelope, and while much of the other animal life kept out of sight by day, it announced its presence soon after sunset.

Just at nightfall the silence was so deep it was oppressive; but this did not last long. Jackals began to yelp; the wild laugh of the hyena echoed through the night; the jungle was vibrant with life.

Finally all lesser noises died out before the majestic roar of the lion, fresh from his kill and come to drink. Occasionally we could catch a glimpse of a flitting shadow or the opalescent red or green of animal eyes in the darkness beyond the circle of our firelight.

When the truly impressive roar of the king of beasts sounded in proximity to the camp, the scared natives immediately roused themselves to renew the smoldering fires, nor did they again let them die down until the light of day had driven the great cats to seek cover at a distance.

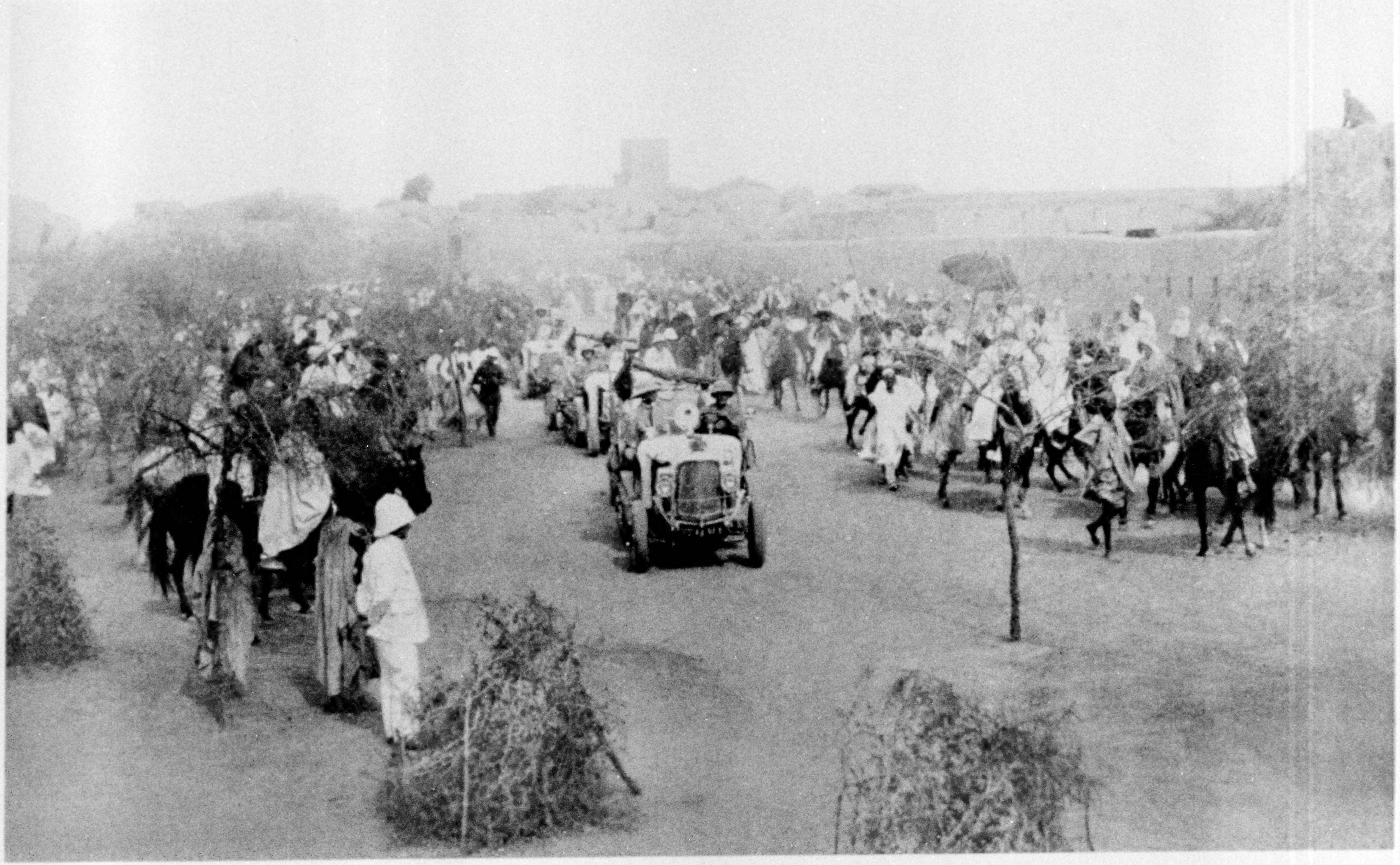
While returning to Yalinga we passed a swamp where about 40 hippopotami were playing, diving and wallowing in the water and mud. Our hunters immediately got into action, and had we not restrained them a massacre might have ensued.

As it was, three of the ungainly creatures were killed and lay floating on the surface of the water like huge balloons (see page 702). The natives were very wary, however, about proceeding to secure the carcasses, well knowing that if they entered the water they would fare badly among the living animals.

### THE NIGHT LIFE OF HIPPOPOTAMI

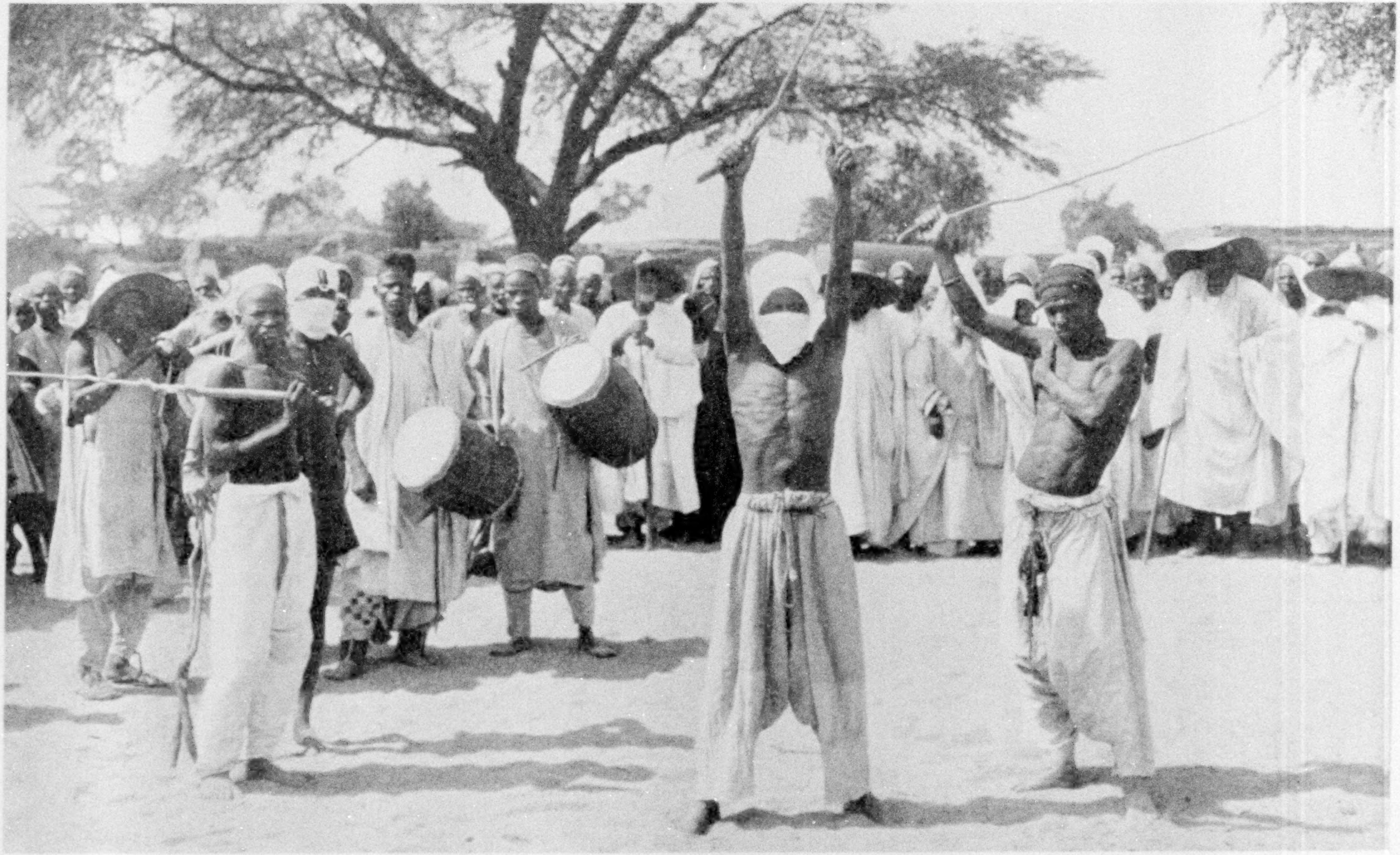
Two members of our party, wishing to study the habits of these great pachyderms, spent a night near their swamp.

As soon as darkness fell, the giant "river pigs" came out of the water and partook of a noisy and generous meal of grass. This over, they disappeared in the woods and were gone for several hours. On



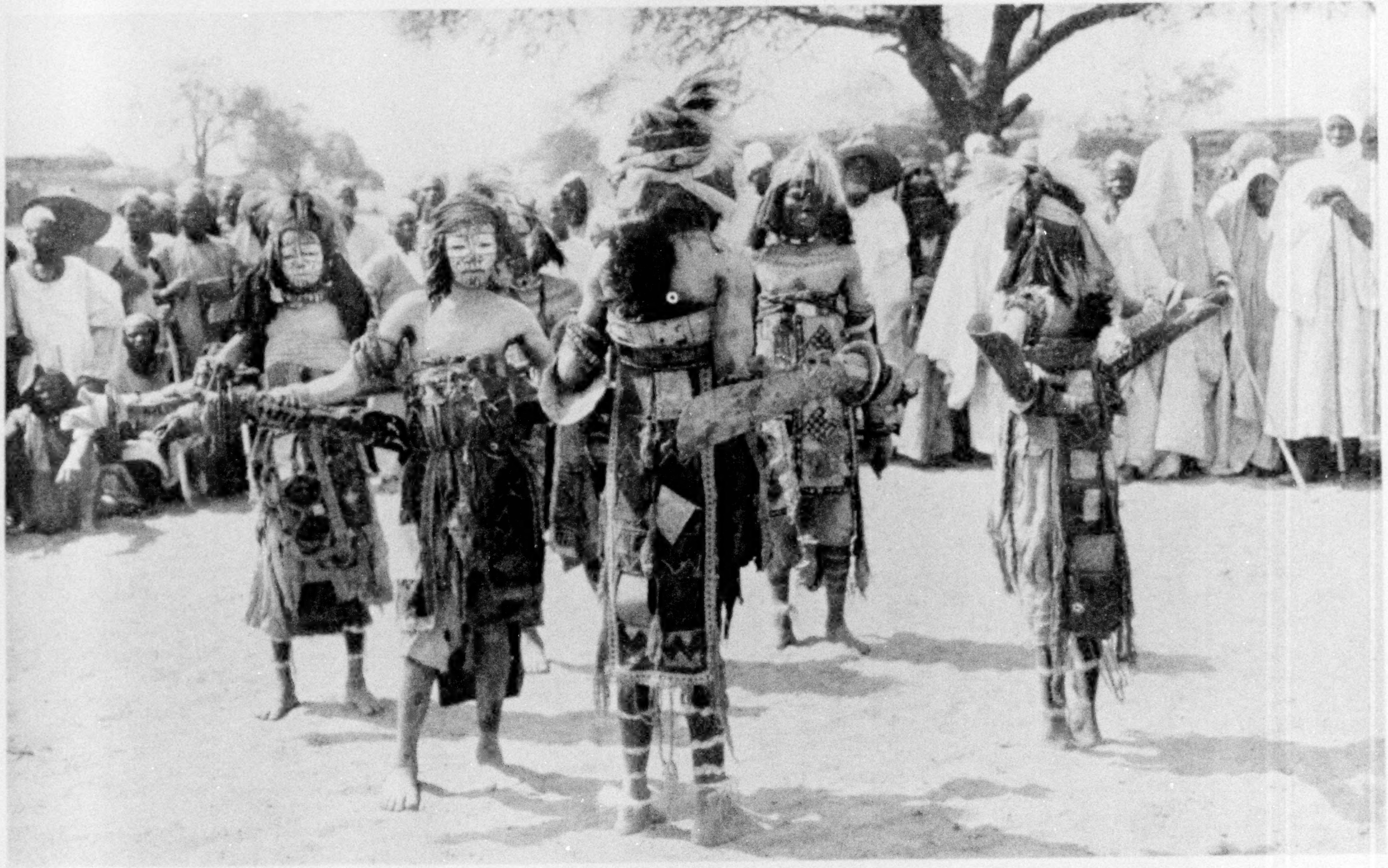
ARRIVAL OF THE CENTRAL AFRICAN EXPEDITION AT ZINDER

The population of the town is mostly Hausa, but four or five other races are represented. It came under French rule in 1900 and is now the headquarters of the Military District of the Niger.

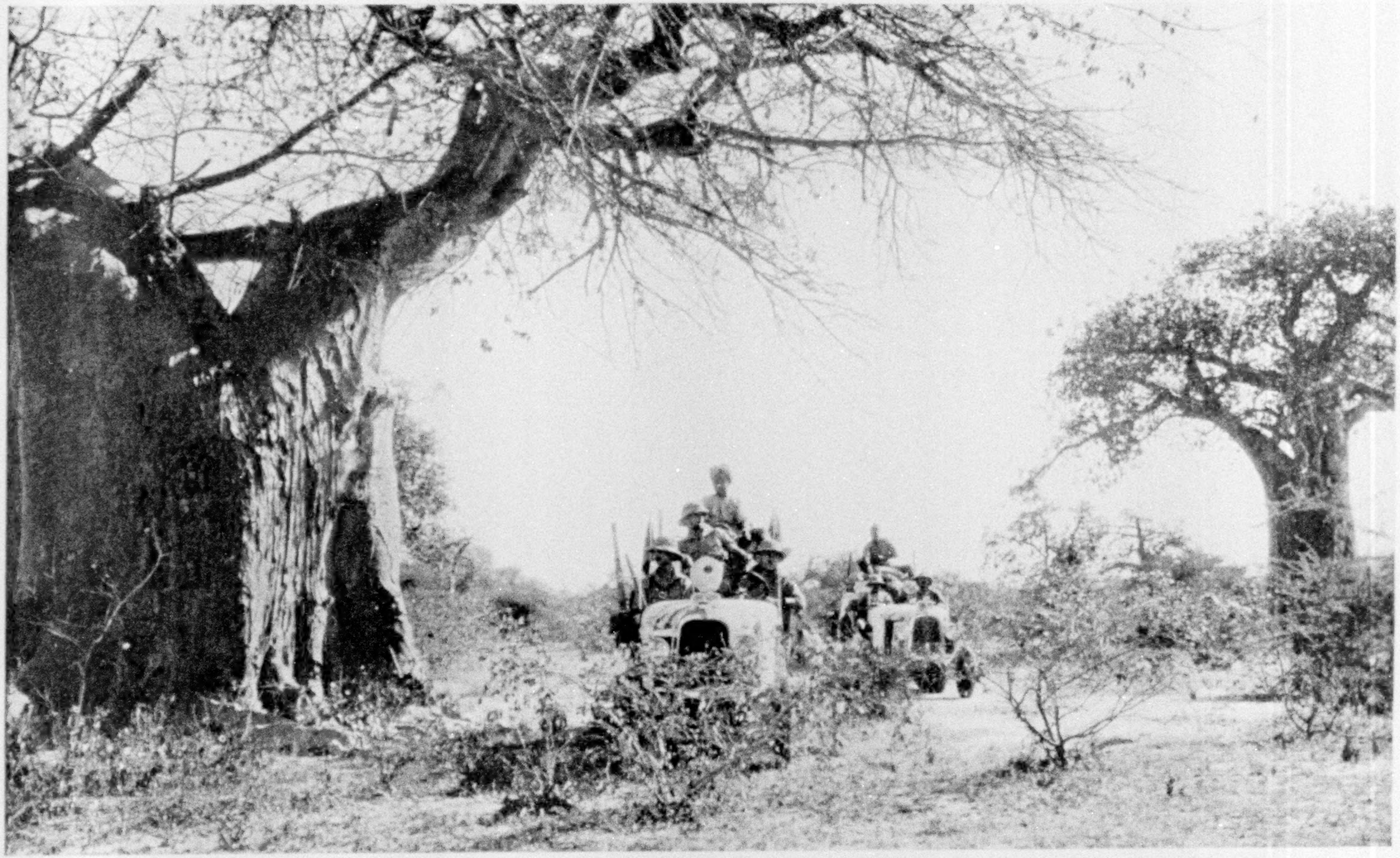


THE CEREMONY OF FLAGELLATION: A SPARTAN TEST AT ZINDER

This ordeal must be successfully passed by every youth of the Peuhl tribe before he may be considered a man and eligible to marry (see text, page 662). The beating must be borne without flinching. The scars of the flagellation are often carried through life.

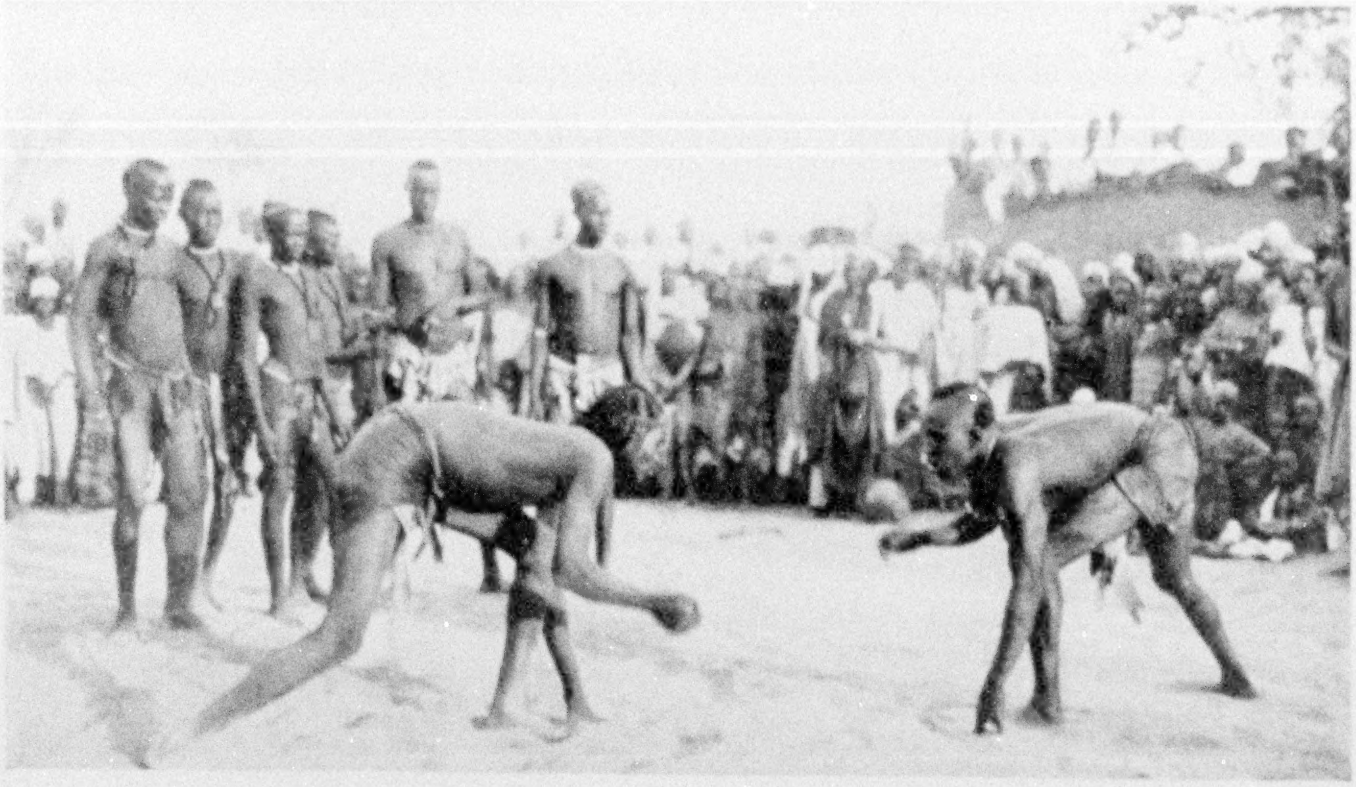


MASKED NATIVE DANCERS OF ZINDER

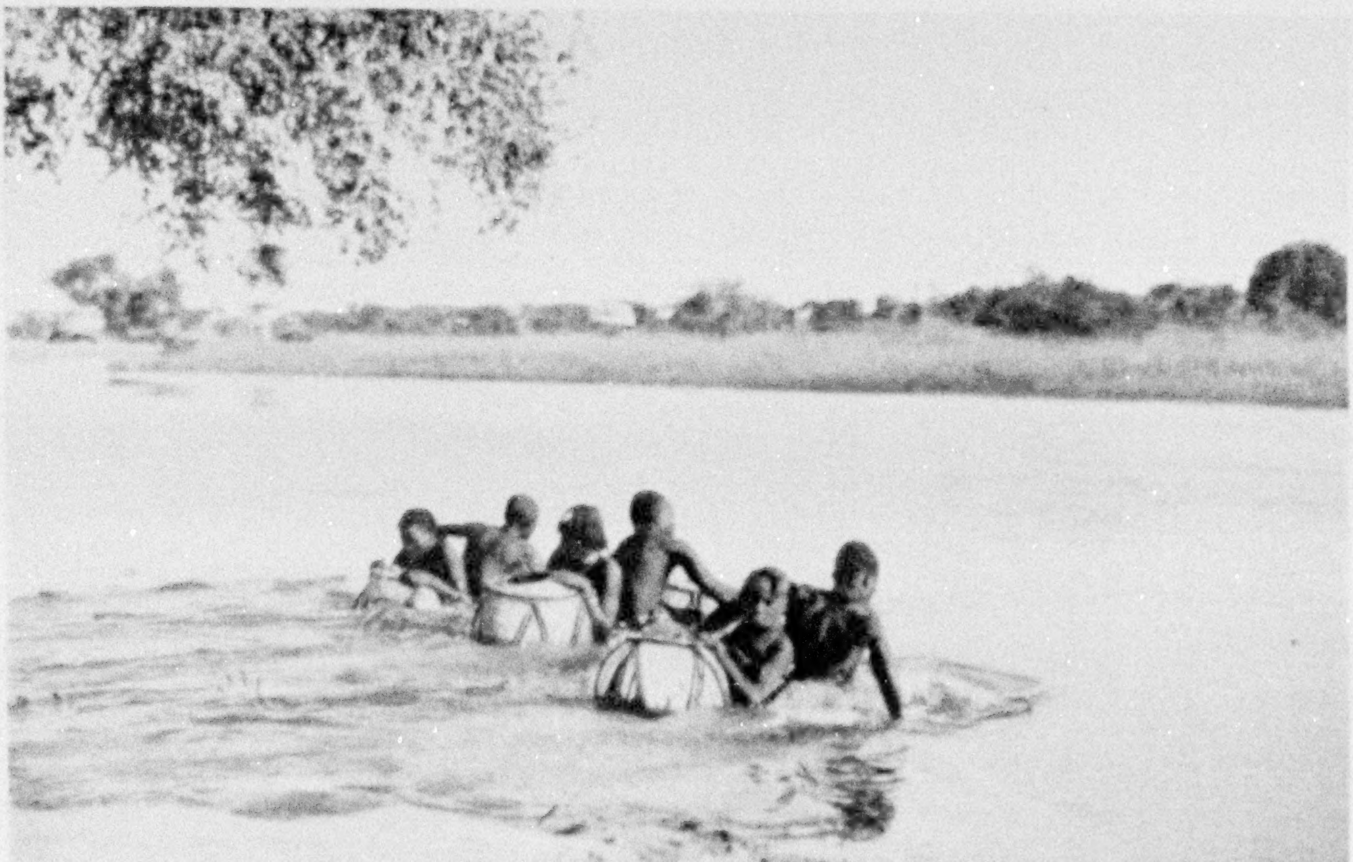


RESTING UNDER A HUGE BAOBAB TREE

The baobab sometimes attains a diameter of 30 feet. It bears an edible fruit, and its bark yields a strong fiber which is used in making both rope and cloth. Baobab trunks are sometimes hollowed out and used as houses, the wood being very soft and pliable. The species is a native of tropical Africa and is found in Senegal, Nigeria, Ethiopia, and in the lakes regions.



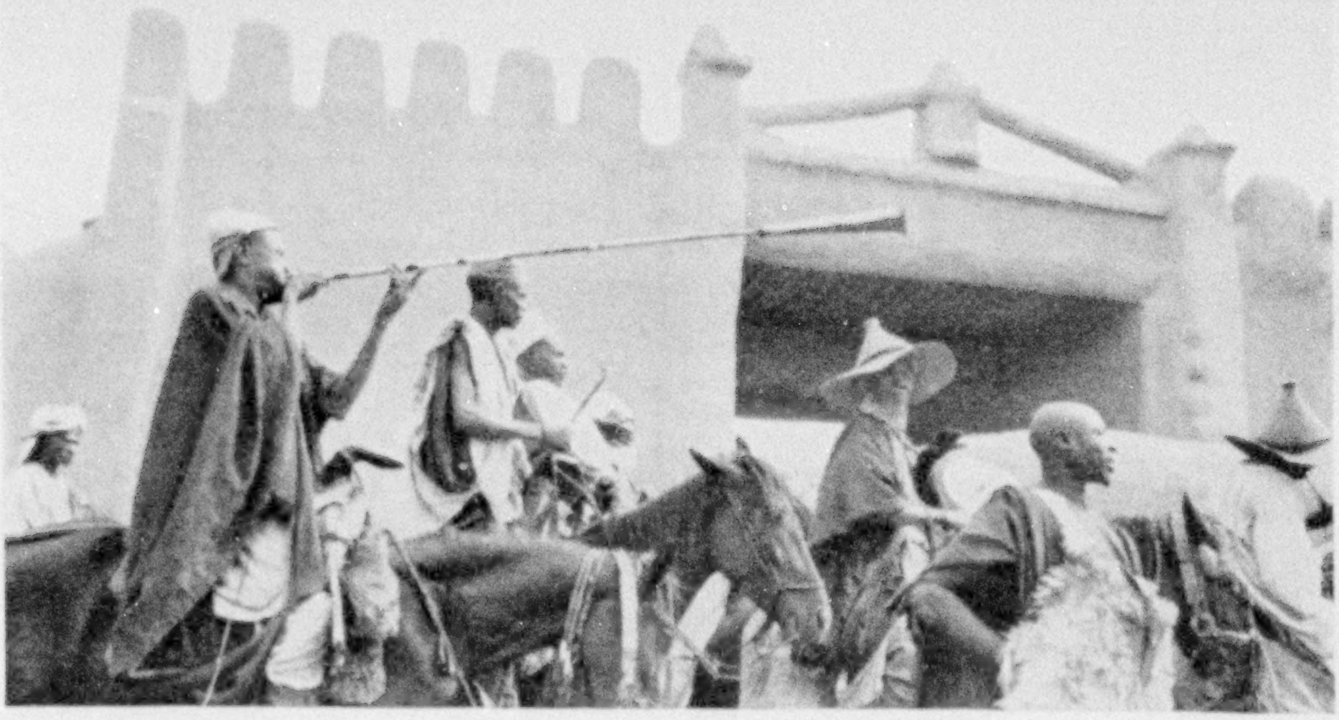
A WRESTLING-BOXING MATCH STAGED FOR THE MEMBERS OF THE EXPEDITION AT ZINDER



RACING SHELLS ON THE KOMADOUGOU RIVER

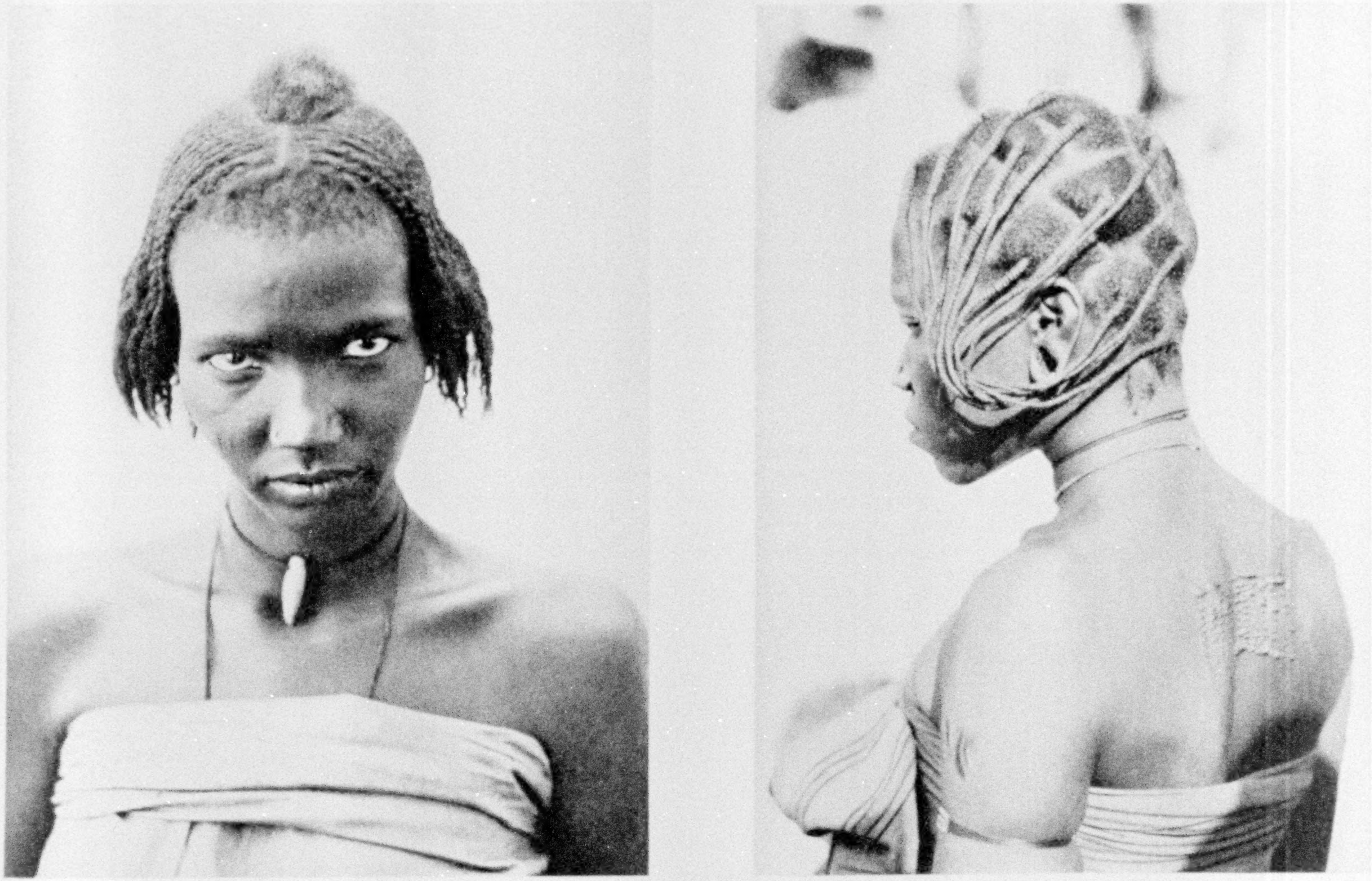
On this stream, which flows between French and British Nigeria, the natives engage in a unique sport. They pair off, man and woman, and sit back to back astride two pieces of wood which unite a couple of large empty gourds. At a given signal, arms and legs work with great vigor and the queer craft moves rapidly across the water (see text, page 663).

A PAVLOWA OF EQUATORIAL AFRICA, ONE OF THE KANEMBOU DANCERS OF THE LAKE CHAD REGION



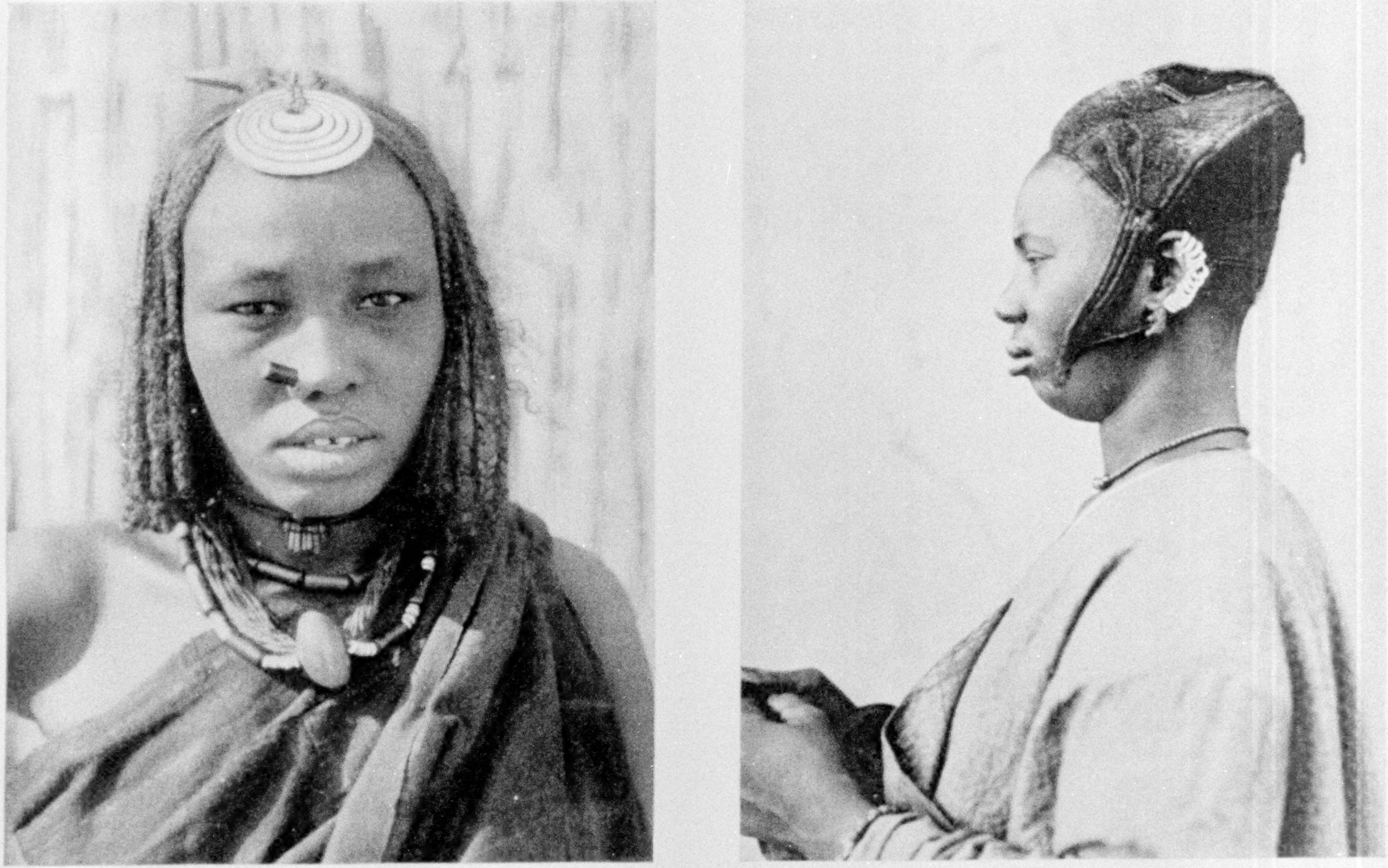
TRUMPETERS BEFORE THE WALLS OF ZINDER

The sun-baked clay fortifications of this great emporium of the trade between the Hausa states of the south and the Tuareg country rise to a height of about 30 feet and can be seen a long distance from the city. Only chiefs of very righ rank are entitled to include players of this peculiar instrument in their retinue.



HAIRDRESSING IS A FINE ART ON THE SHORES OF LAKE CHAD

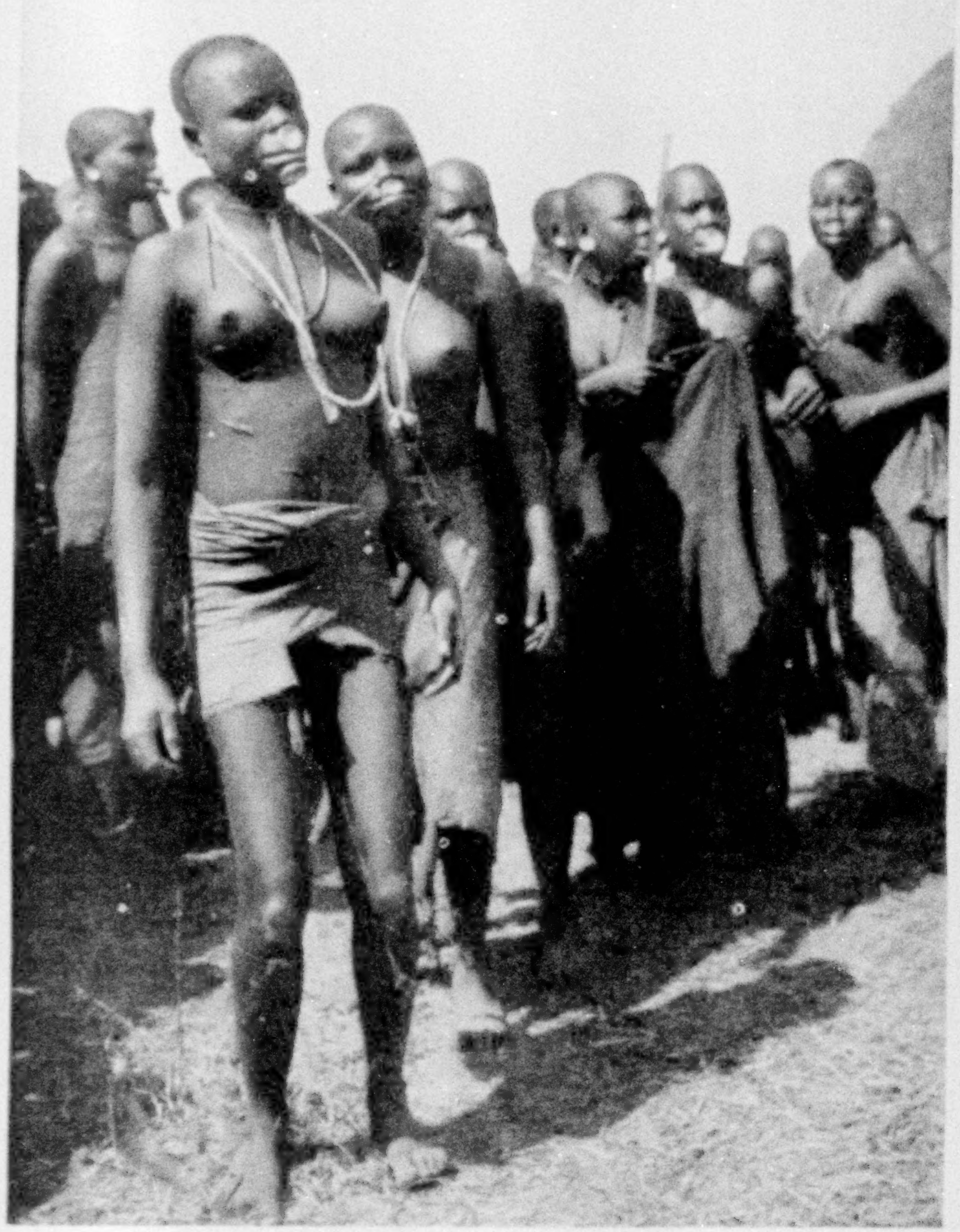
The women of Central Africa wear so few clothes that their wardrobe demands little or no attention, and much of the time and interest devoted in civilized communities to gowns can be spent in bizarre arrangement of the hair.



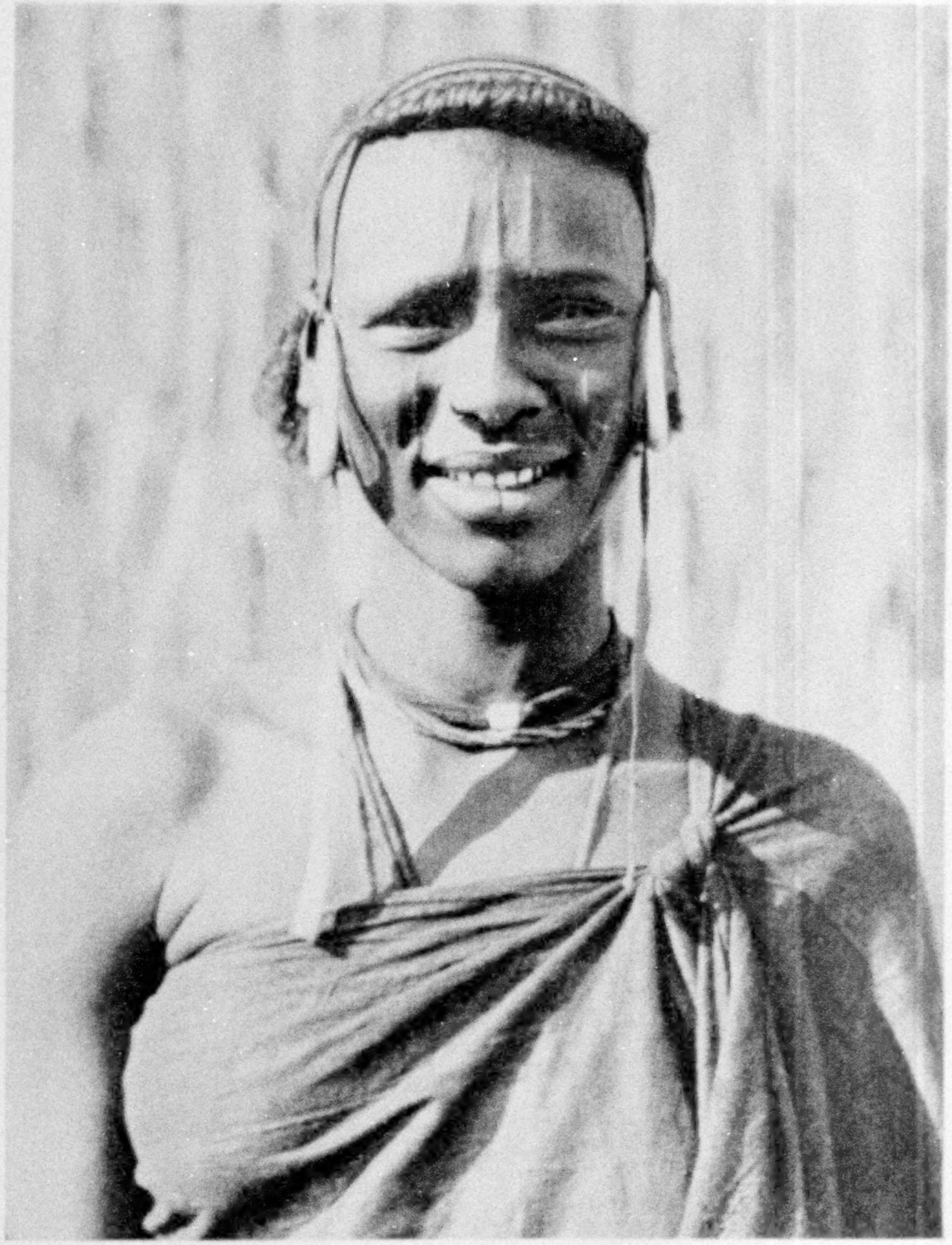
EVERY MAID TO HER OWN FANCY IN CENTRAL AFRICA

The plug in the nostril is a mutilating type of decoration to which African women are partial.

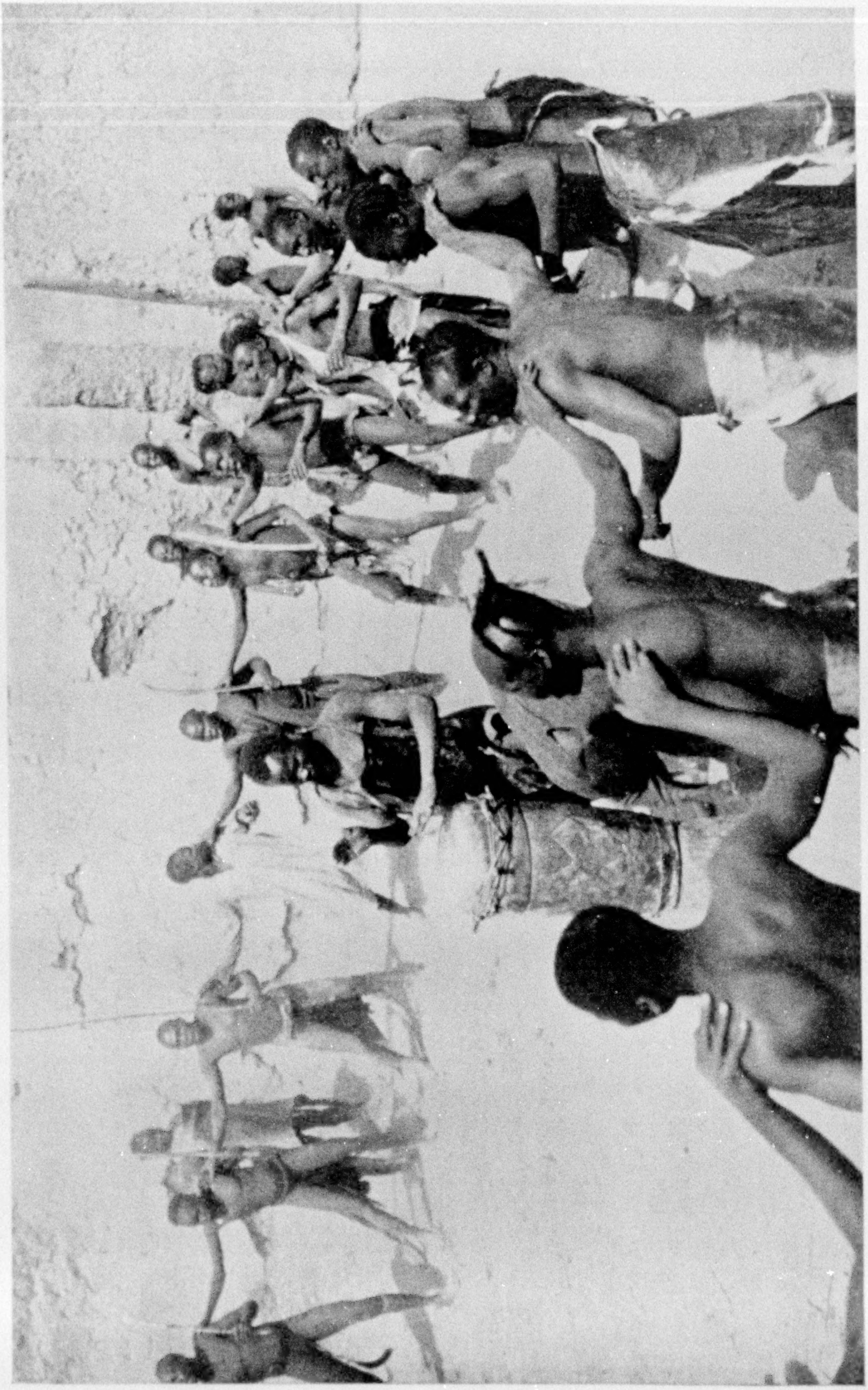
Not content with the usual single earring, this belle has found room for thirteen.



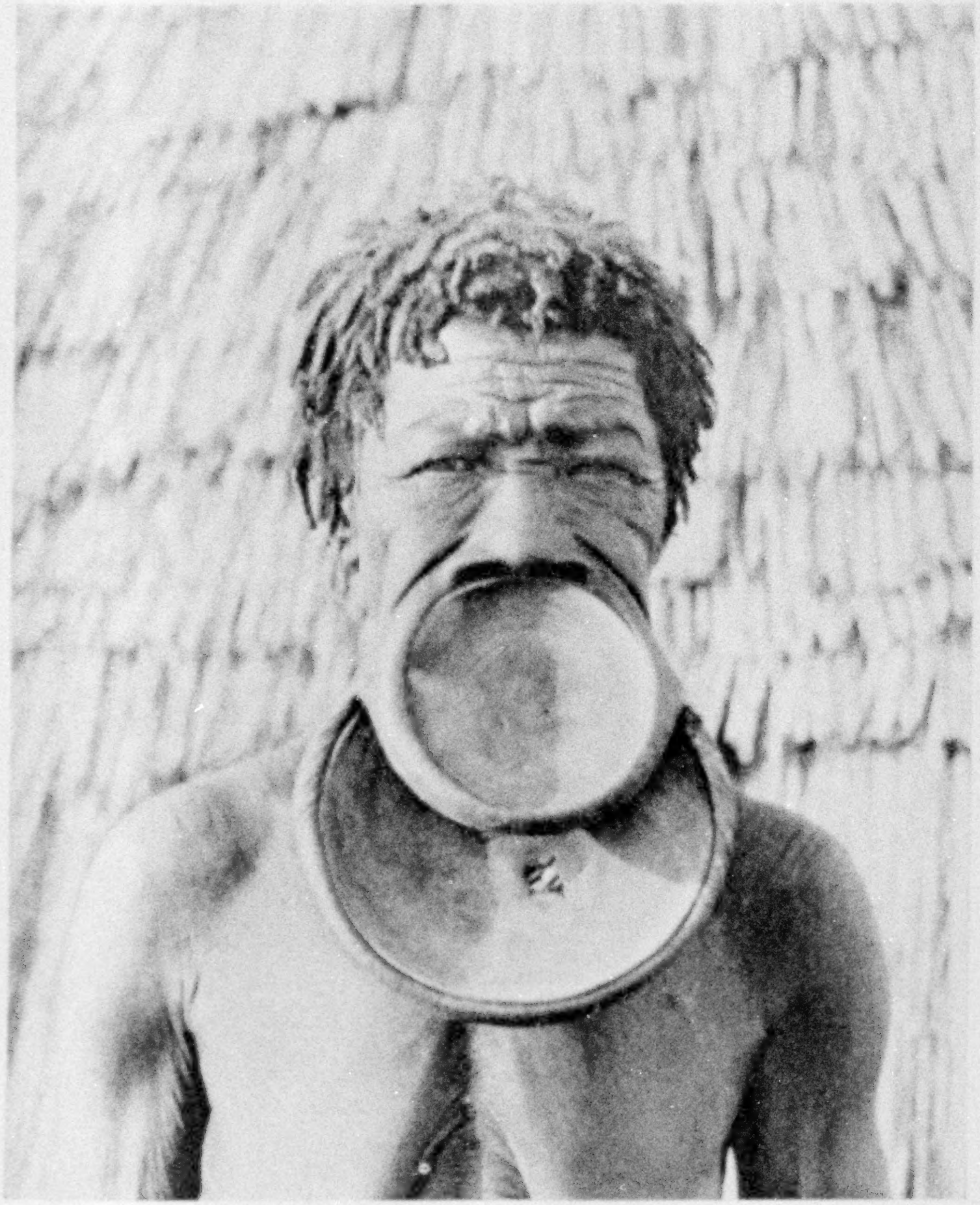
WOODEN WASHERS IMBEDDED IN THE LIPS ARE ESSENTIAL TO BEAUTY IN THE VILLAGE OF MOGOROM



A KANURI WOMAN: A MIXTURE OF FELLATAH, ARAB, AND NEGRO BLOOD FLOWS THROUGH HER VEINS

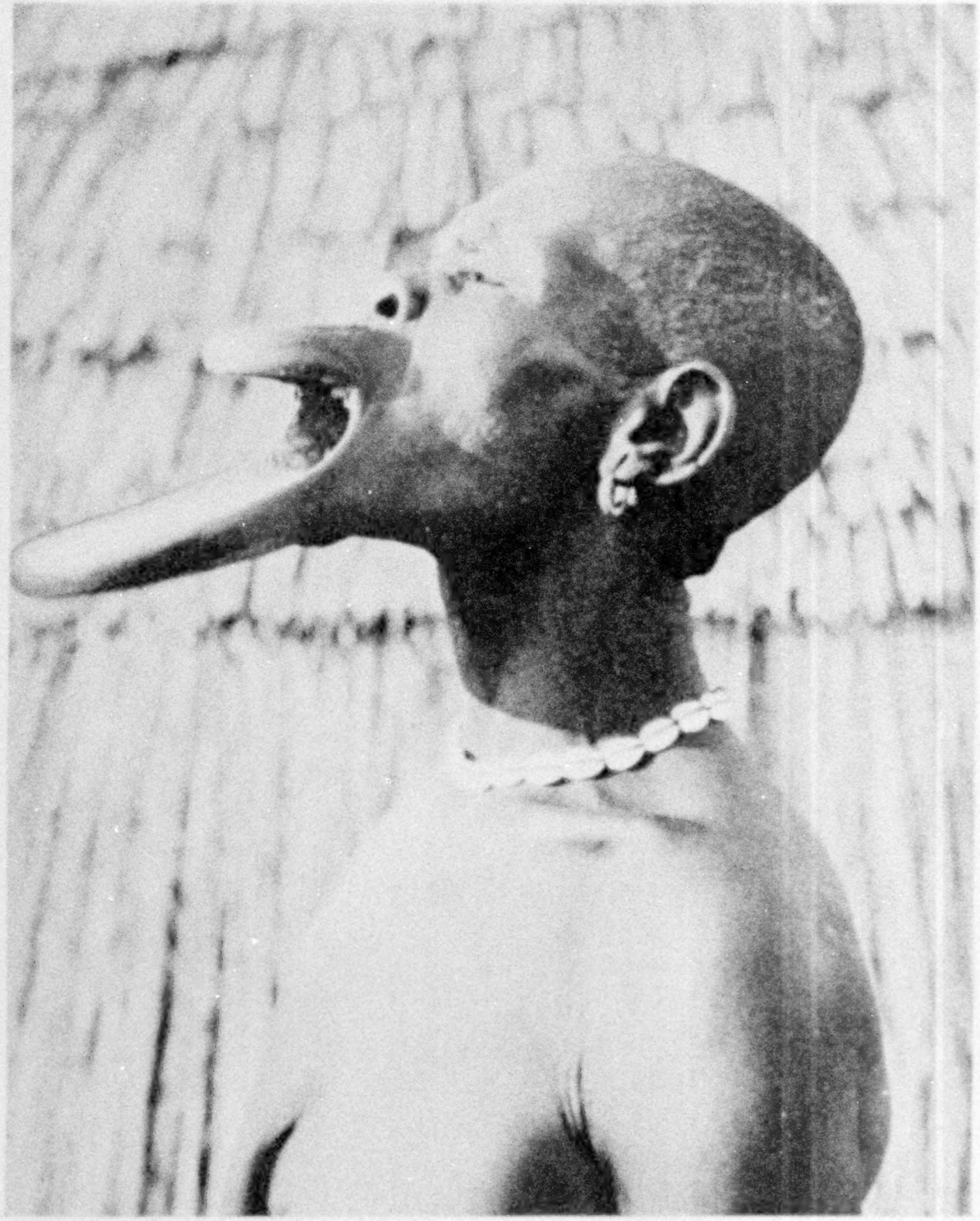


A MOGOROM DANCE, FOR MEN ONLY



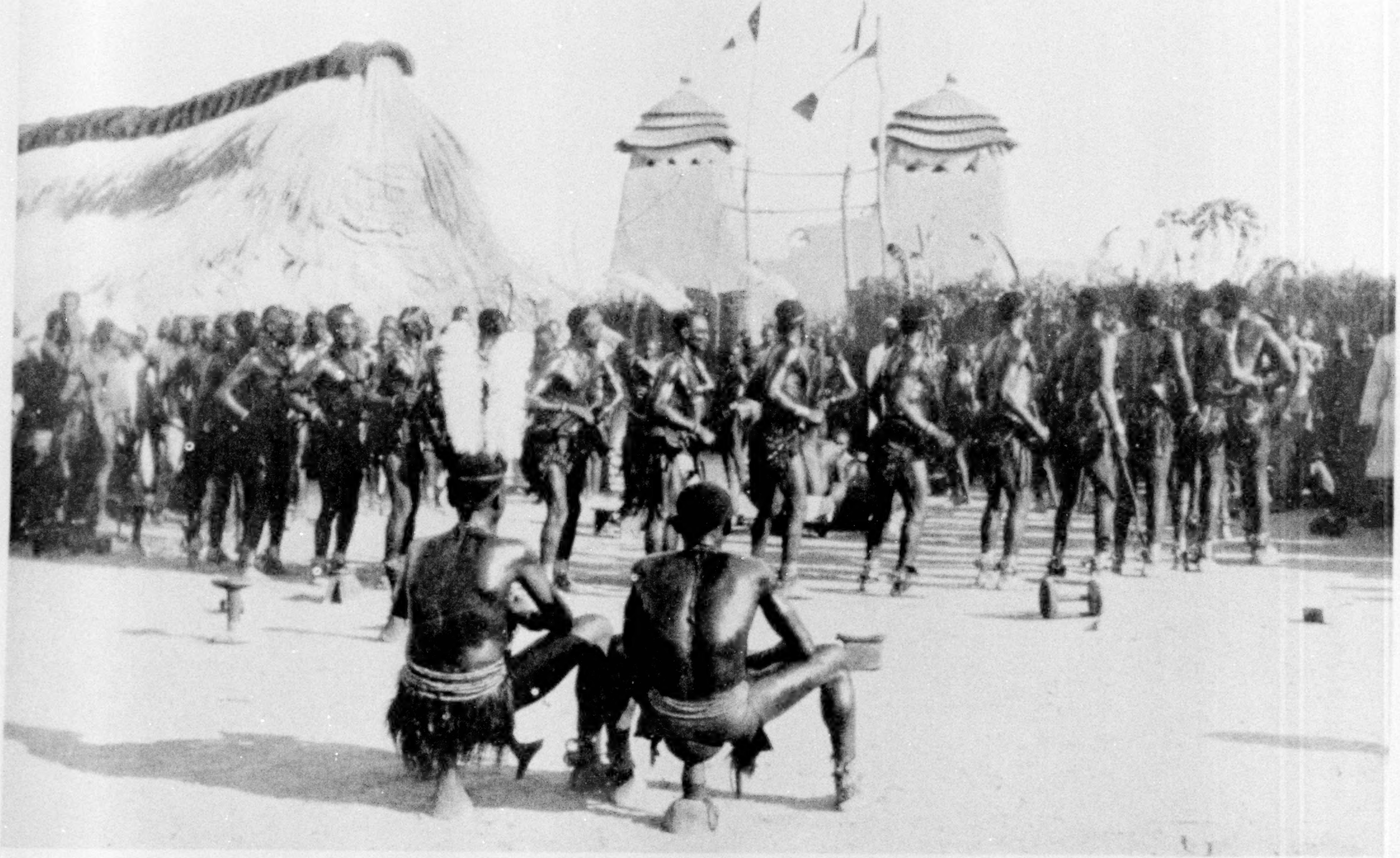
A TRIUMPH OF FASHION

The victims of this bizarre custom are often rendered practically speechless by the distortion of their lips. So difficult is it for them to pronounce a word that their own people can seldom understand them. Occasionally the disks are removed, leaving loosely hanging rings of skin that are quite unmanageable.



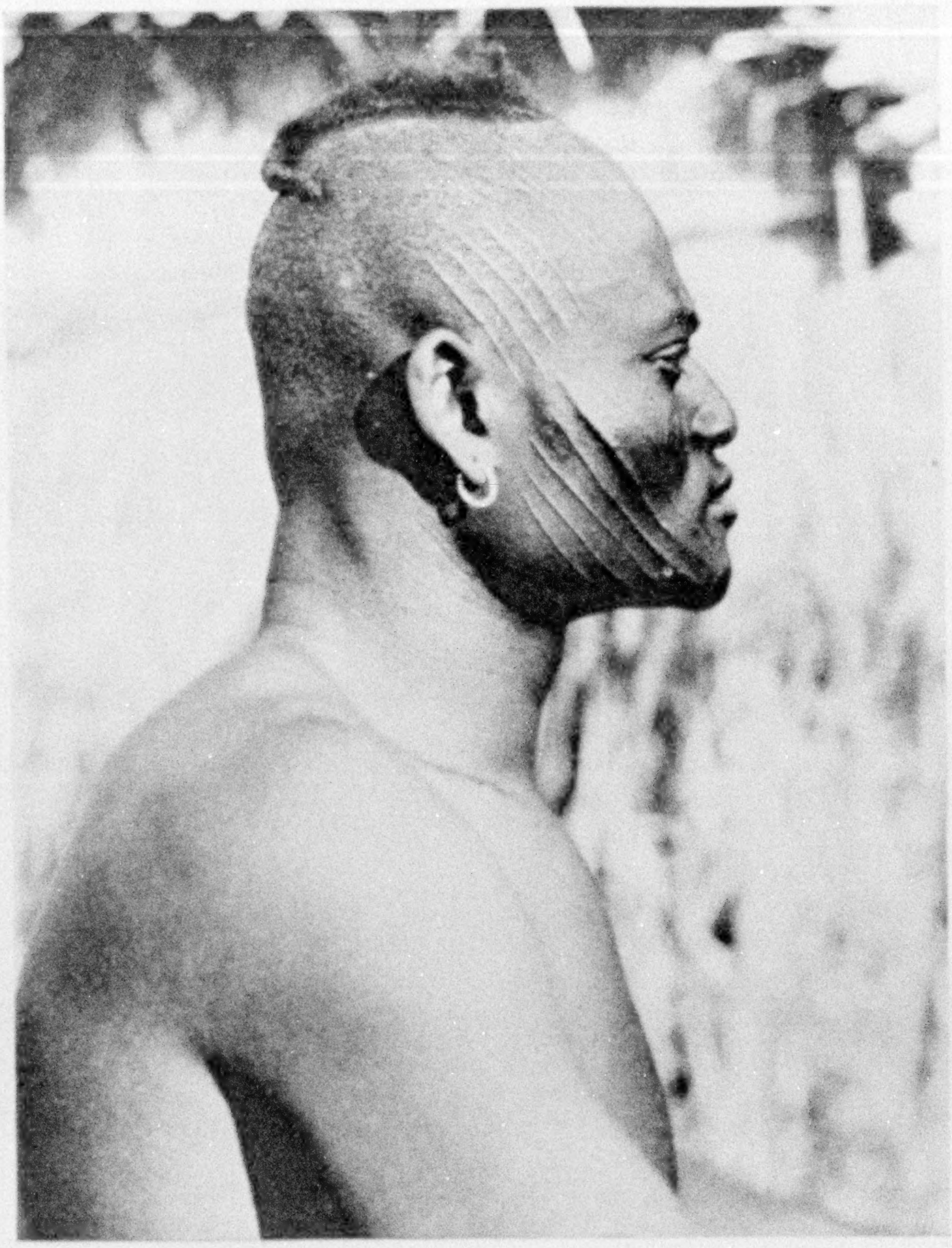
THE REIGNING BEAUTY OF MOGOROM

The women who wear such great wooden disks in their lips often learn to use them as sounding boards, over which they are able to manipulate their tongues in such a way as to produce terribly shrill and blood-curdling yells. It is usually necessary to extract all the front teeth to make room for these disks.



A DANCE OF THE YONDOS, AN AFRICAN SECRET SOCIETY

Though the conduct of this sect appears to be quite blameless, the members are regarded with a respect tinged with fear (see text, page 668). Before European supremacy was established, such sects often ruled their fellow tribesmen to suit their own ends, and in one village an officer of its secret society came to be regarded as a sort of deity personifying legal punishment. He went abroad at certain regular intervals and executed the judgments of the order by beheading everyone considered objectionable.



WOMEN OF THE LAKE CHAD REGION HAVE NO MONOPOLY ON FACIAL MUTILATION

their return they again dined on grass, and came so close to our watchers that these startled gentlemen were just about to light fires to prevent any more intimate association. At daybreak they were all back in the water, but so noiselessly had they accomplished their entry that our friends were unable to say when it took place.

### A BARBAROUS ELEPHANT HUNT

On reaching Yalinga we found that the Governor of the Colony had arranged for us the spectacle of an elephant hunt by fire, his prime motive being that we might see what a barbarous practice it is and help him stop its wide and indiscriminately destructive use.

The natives cut a circular path around the places where the elephants forage, leaving nothing along this path which might burn easily. When the great beasts have entered this circle the neighboring villagers are noiselessly posted around the edge about eight yards apart.

They are provided with torches, and at a given signal fire the bush and grass within the circle, until soon there is a roaring wall of flame surrounding the unfortunate animals.

### TRIBAL SEERS FORETELL SUCCESS OF THE HUNT

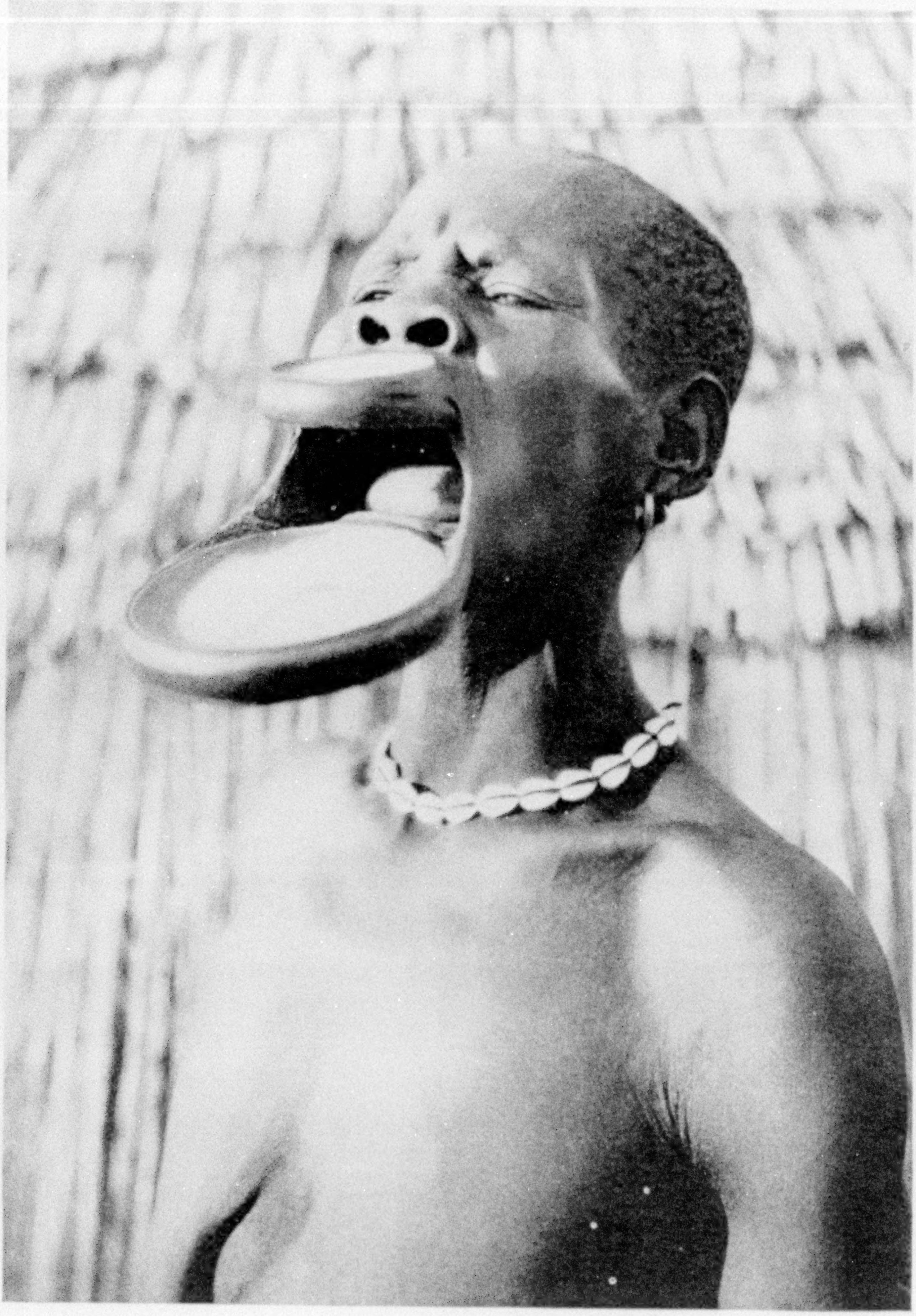
Frantic with terror, the elephants rush to the center of the circle, covering themselves with branches as protection from the flames. But their efforts are futile, and, defenseless and blinded by smoke, they huddle together, while the natives kill them with their spears or wait until the fire has destroyed them.

The night before this "hunt by fire" was held incantation ceremonies took place in the native camp. The two chiefs, Said, of Arab descent, and Tati, a full-blooded Negro, played the leading rôles as prophets.

Said, his chest bare and shining, watched the flames of a bright fire very intently, and then suddenly shouted in a loud, harsh voice, "I can see, close to the great rock at the end of the *paille* (feeding grounds), some fine elephants with long tusks. . . ."

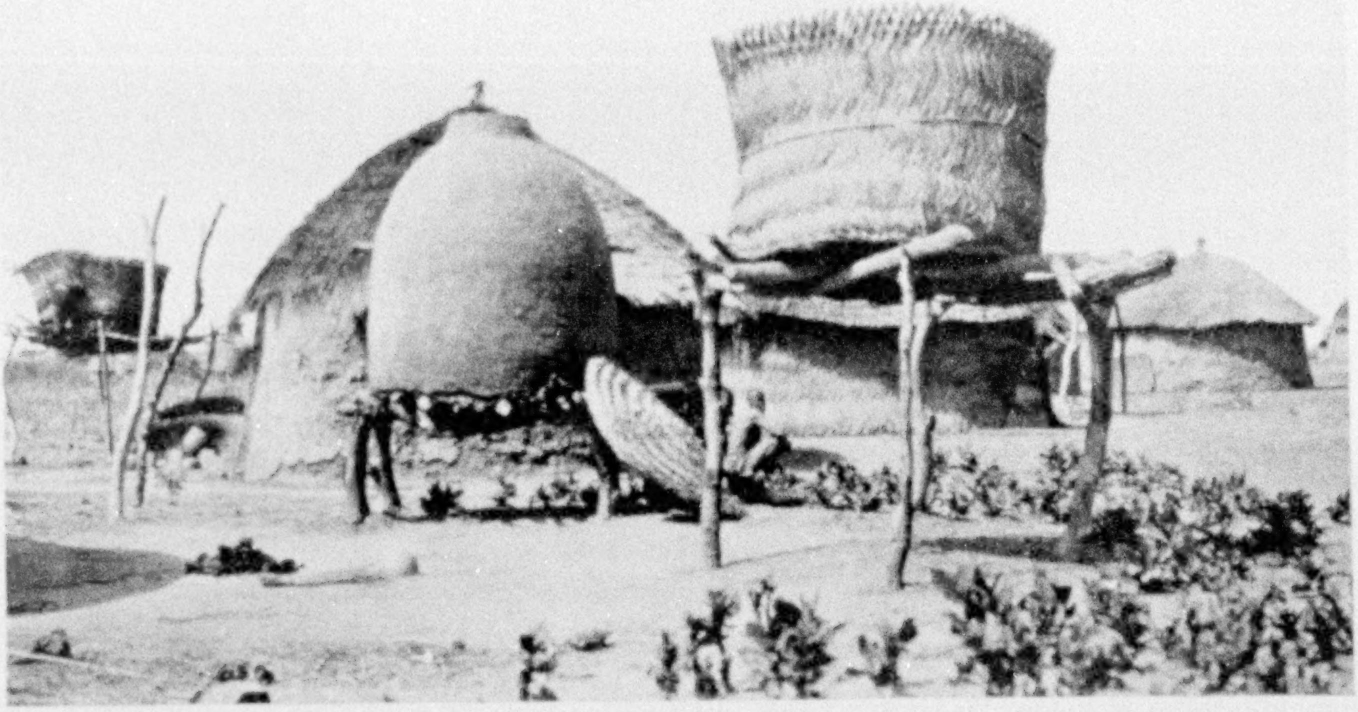
In a chorus arose the voices of his people, who were also gazing into the flames: "He sees . . . . he sees elephants. . . . Let him look further."

Whereupon Said proceeded to take a second peek and made other revelations, chief among which was a recommendation



SHE HAS DEVOTED HER LIFE TO MAKING HERSELF BEAUTIFUL

When the girls of some of the tribes to the south of Lake Chad are between eight and ten years old, a slit is made in the outer skin of each lip and light metal disks are inserted. These are later replaced by wooden ones, and their size is gradually increased until the lips have stretched to incredible proportions. Colonel Haardt encountered women wearing in their lips disks as big as breakfast plates.



GRANARIES OF WOVEN GRASS AND CLAY

For protection against rats and insects, these storehouses are built on platforms. They are important adjuncts of a village, serving to tide over the periods between crops.

to start at daybreak. His people echoed his words and then lapsed into silence.

The stillness was broken by an outcry from Tati's followers. "Let Tati approach, Tati shall see. . . . He, too, reads in the flames."

Tati, his chest also bare, came near the fire and, gazing fixedly at it, said in a sonorous tone: "I do see other things, and what I see is the only truth!"

To which rather positive, if not egotistical, statement his followers chorused their agreement.

After an extra long scrutiny of the licking flames, Tati resumed: "I can see two big herds, but they are far away, near the monkeys' stream. We must start long before daybreak if we are to get them."

Again his followers repeated his words, and then both parties voiced their enthusiasm at the good omens which promised them much meat and ivory.

### THE EXPEDITION ENTERS THE BELGIAN CONGO

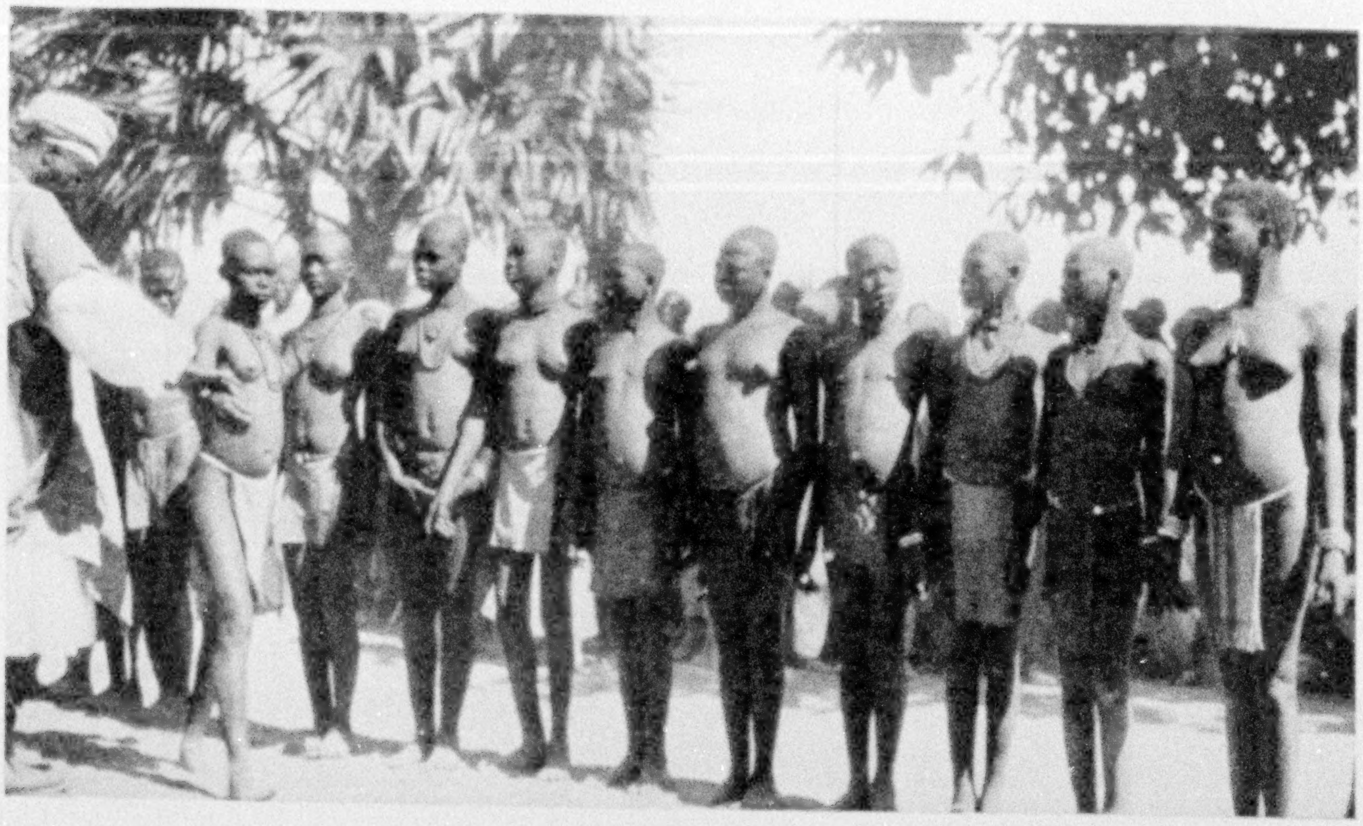
On the 1st of March, 1925, we left French territory and, entering the Belgian Congo, soon found ourselves in the midst of the Equatorial Forest.

The beauty of this part of the country is awe-inspiring. The thick foliage makes a roof above one's head, and the intricate roots and tangled branches lend themselves readily to the workings of a vivid imagination (see pages 702 and 704).

What surprised us most in the great forest was its silence. We had supposed there would be a noisy and entertaining animal life, but not a bird call or a monkey yell broke the stillness.

We all breathed more freely when we reached the glades, where cultivated lands and villages were to be found, after traveling for more than 375 miles over a trail cut through the forest for us by our Belgian friends, who employed 40,000 natives in its construction and completed it in less than a month.

Some of the many thrills we experienced came when we took our cars across precarious wooden bridges. They were made of comparatively slender branches tied together with lianas and reclining on light buttresses. They were usually from



EACH YEARNS TO BE ADJUDGED THE LOVELIEST OF HER TRIBE

At Fort Archambault the author and his companions witnessed a native beauty contest (see text, page 669, and illustration, page 694).

80 to 130 feet long and often from 15 to 35 feet above the river or ravine (see illustration, page 703).

It was always with fear and trepidation that we drove our first car out on these bridges, which creaked and swayed in a most alarming manner, but fortunately most of the vibrations were lateral ones and we suffered no mishaps.

### A WEIRD TELEGRAPH SYSTEM IN THE JUNGLE

The native African of the Equatorial Forest may not know much about wireless telephony, but he has a sort of "radio" system of his own that serves his purposes admirably. It is effected through an instrument known as the *goudougoudou,* made of a block of wood about 6½ feet long and 3 feet thick. It is excavated through a large slot drilled in its upper part and a smaller one cut in one side (see illustration, page 705).

A player strikes the instrument with two wooden hammers, the ends of which are covered with natural rubber, and various sounds are obtained, according to the place and strength of the strokes.

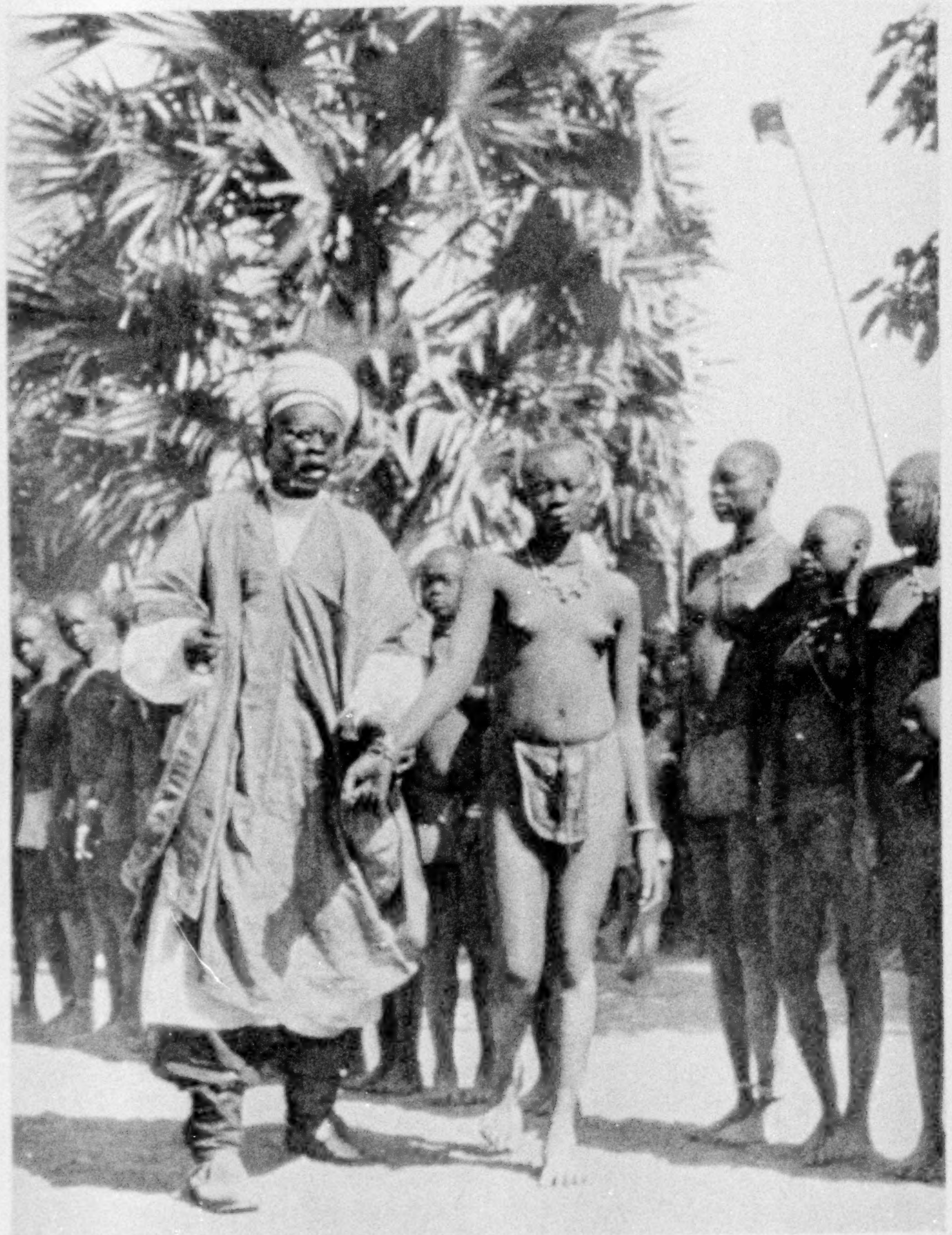
The instrument is placed in the middle of the village, just in front of the chief's hut. When a message is to be sent the goudougoudou player strikes it off. The sounds can easily be heard six miles away, and when produced on the bank of a river will carry for nearly ten miles. News is forwarded in this way over incredible distances.

We rather doubted the efficiency of this strange telegraph until we were forced to believe by a personal experience. When passing through a certain village we asked its chief for four chickens to be brought to us a short distance ahead on the road we were to follow.

As the goudougoudou player struck the message off on his instrument, we drove rapidly away, so that the chief could not cheat by sending runners off ahead of us. Three miles beyond the village a native stood waiting by the roadside with the four chickens we had asked for. We were convinced.

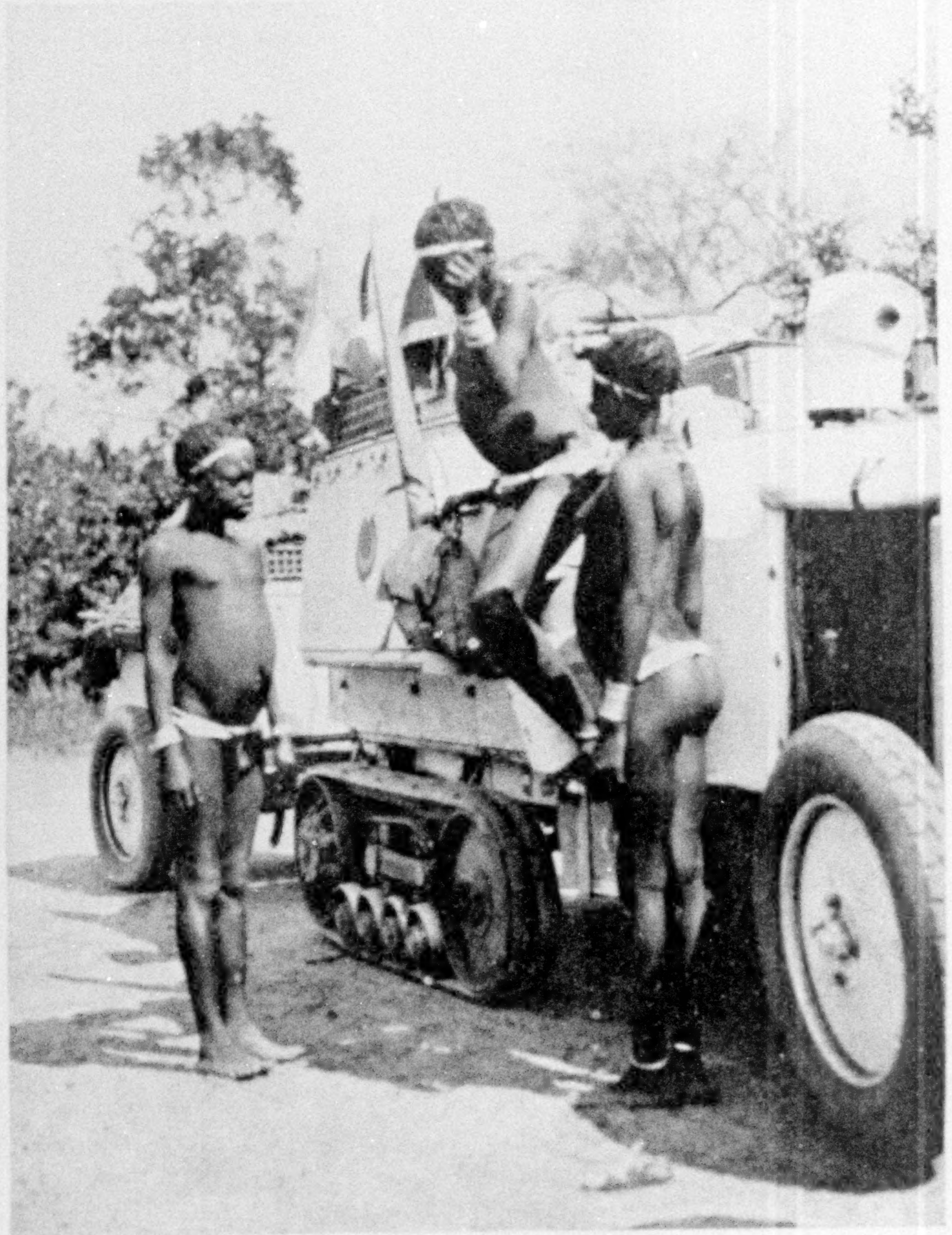
### JUSTICE AS IT IS METED OUT BY AFRICAN CHIEFS

At Stanleyville a fine reception awaited us. The Governor and most of the European colony came to meet us in motor cars some miles from the city. As we entered through a triumphal arch, we were rendered military honors and the school children sang choruses.



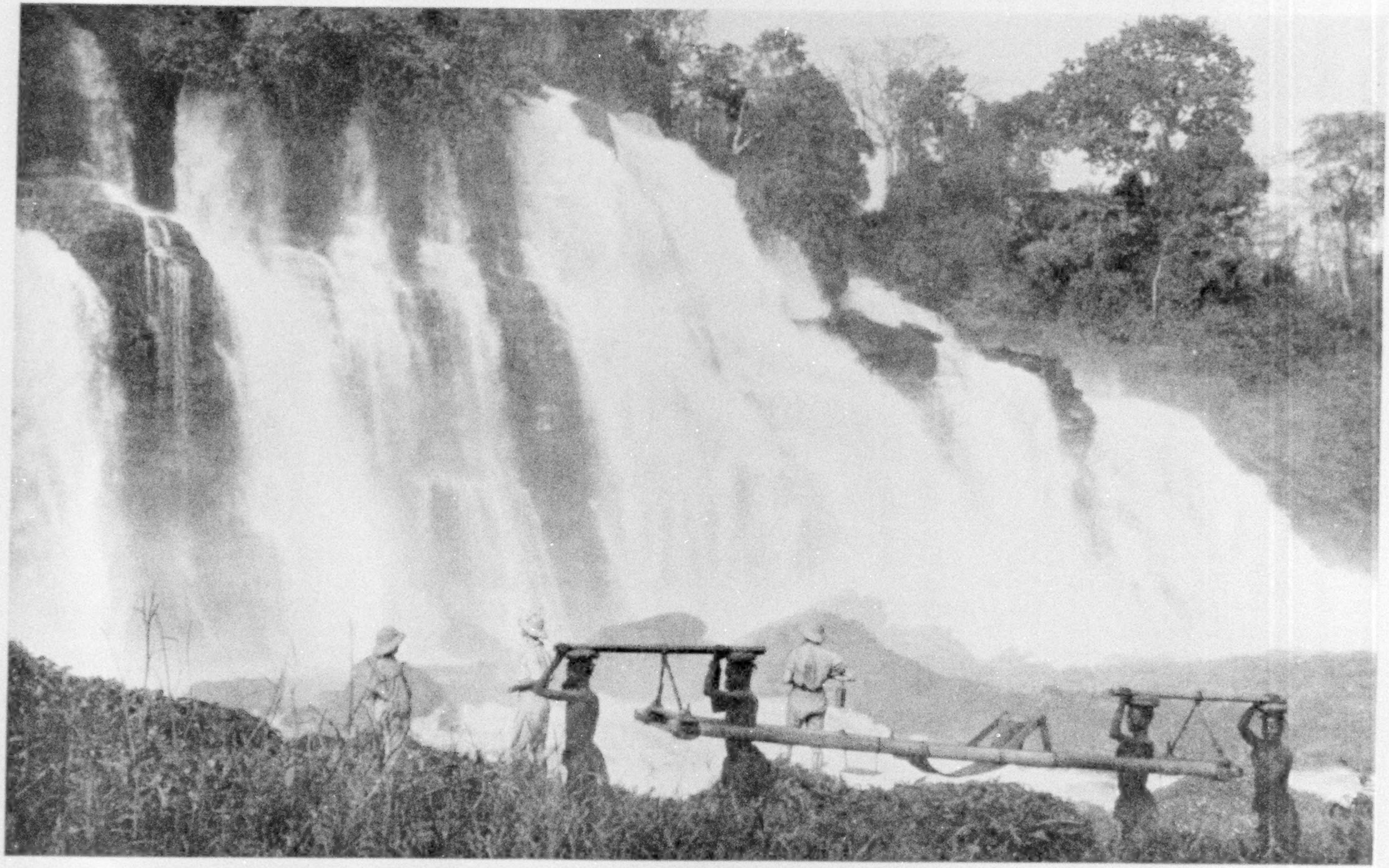
THE BEAUTY CONTEST WINNER (SEE, ALSO, PAGE 693)

This young Sara maiden was adjudged the most beautiful among more than 500 contestants because of the perfection of her feet.



SATISFYING NATIVE CURIOSITY

From the Sahara to Mozambique the strange "animals" that carried the white men so speedily without getting tired or thirsty excited wonder.



A WATERFALL NEAR BANGUI, ON THE BORDER BETWEEN FRENCH EQUATORIAL AFRICA AND THE BELGIAN CONGO

Note the cumbersome outfit which serves as a sedan chair in this region of Central Africa.

A RELIGIOUS DANCE BY NATIVES OF THE BANGUI DISTRICT

A paste of clay, powdered bark, and ashes is used to paint the bodies of the dancers. Note the plaited leather whips which the performers carry and their arrow-studded headdresses.

Native African justice sometimes takes amusing turns, and M. Poirier saw such an instance in the court of "Judge" Chief Wagenia. It seems that the accused man had laid his nets in a part of the river which was denied to him. The plaintiff urged with great emphasis that he had suffered the loss of a potential profit by reason of this poaching, the value of the fish caught being considerable.

Wagenia listened intently to both plaintiff and defendant, and then rendered judgment in favor of the latter, completely clearing him on the ground that there were sufficient fish in the river to satisfy everyone, and that he had simply made a lucky catch.

But the plaintiff was not to be downed so easily, and again addressing Wagenia, he said: "Oh! powerful chief, I forgot to tell you that this man was also fishing in the part of the river which you have reserved for your own use."

The honorable judge jumped up with a most undignified howl of rage. "What! He fished in my part of the river? Send him to jail for 15 days!"

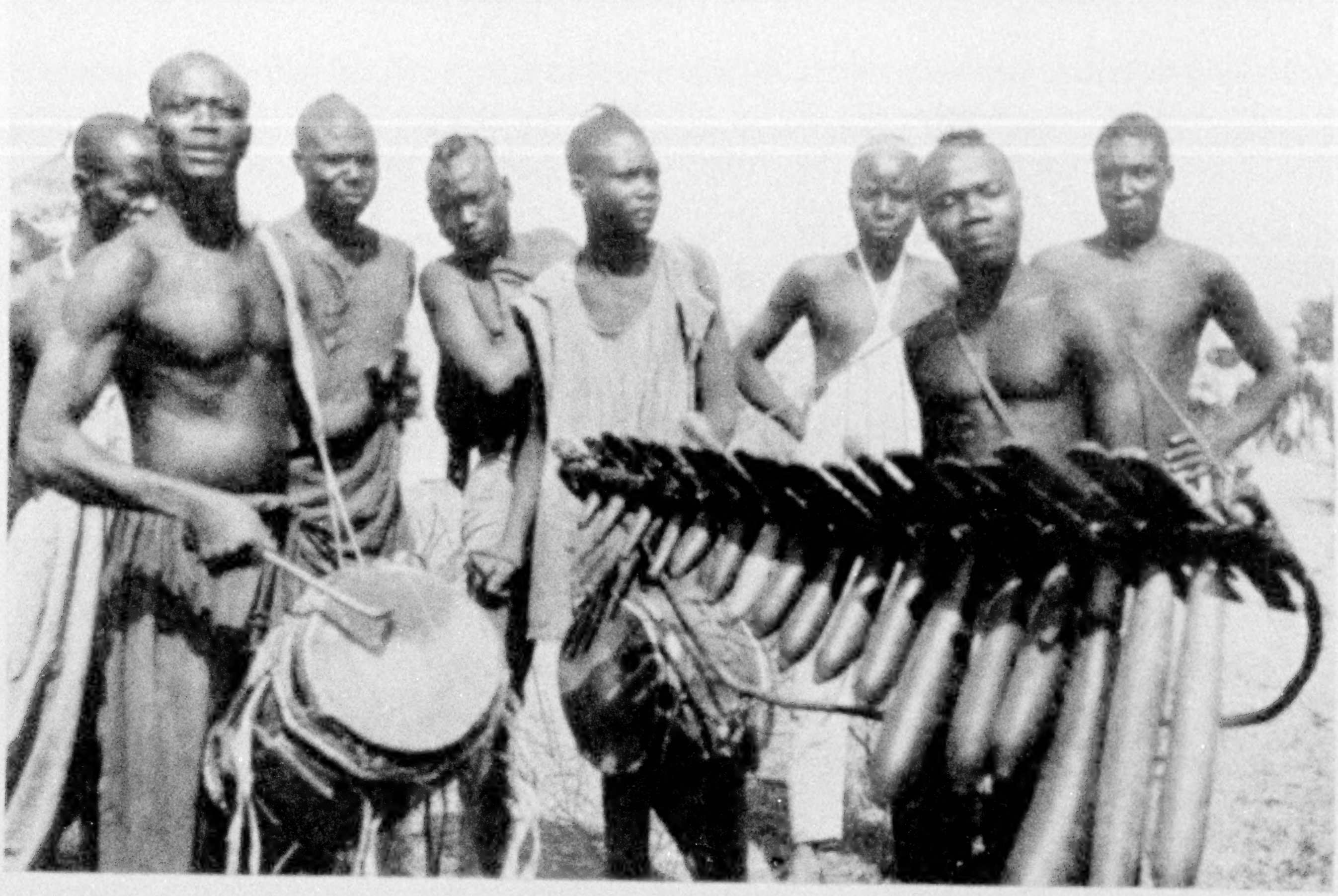
To complete the bizarre aspect of this picture, the eminent jurist, clad only in loin cloth and feathered hat and wearing the panther-tooth necklace that denoted his authority, left the "judge's bench," mounted his *bicycle,* and pedaled away at top speed.

### AFRICAN ELEPHANTS BEING TRAINED FOR HEAVY LABOR

The African elephant has not proved as easily amenable to domesticity as his Asiatic relative, but the Belgians have met with more than average success in training the great beasts at a station maintained especially for this purpose at Api. Here we saw 55 elephants, including a dozen young ones, four of which had been recently captured.

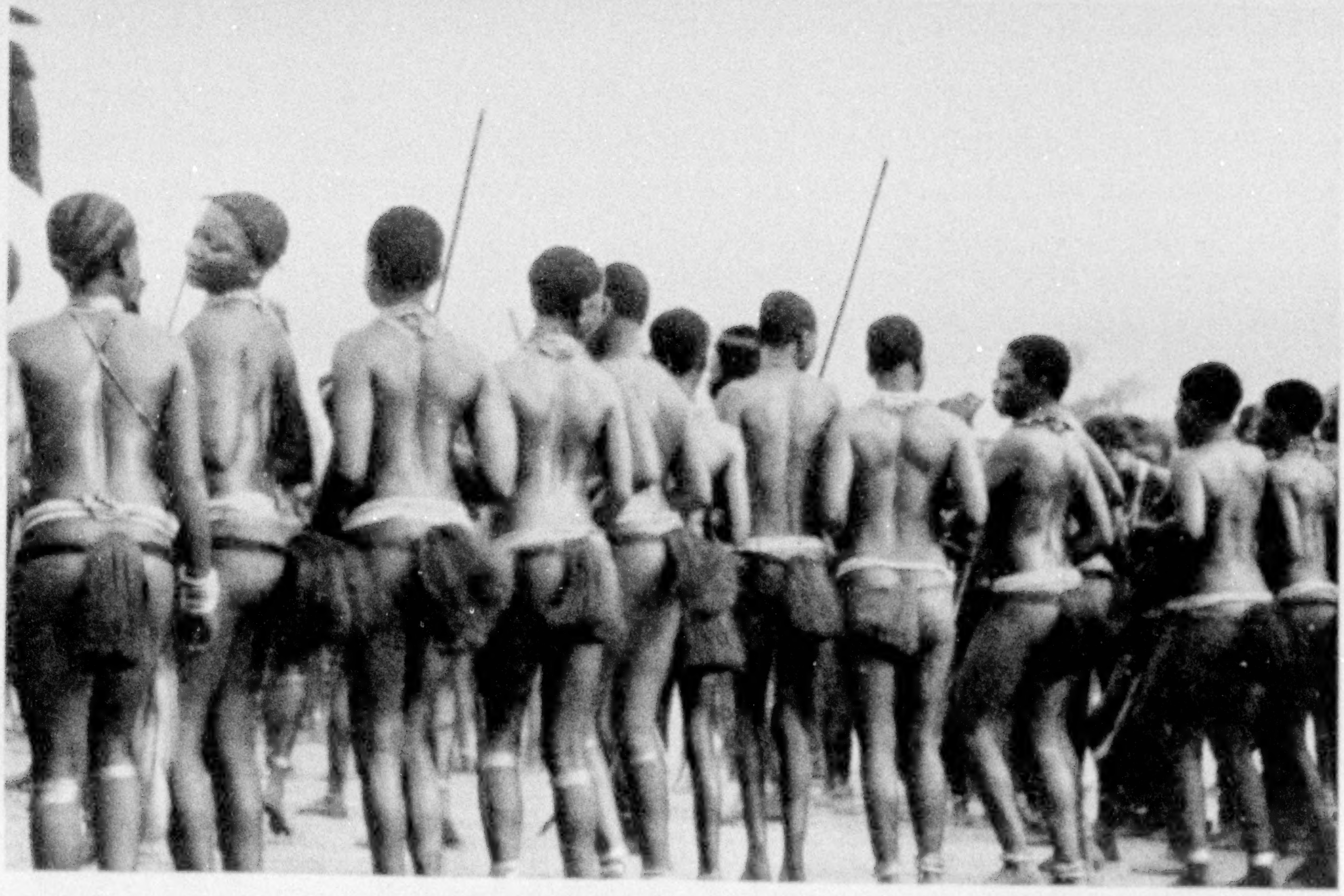
When first brought in, the young captive is tied to a stake near a tame elephant, which is to be its instructor and exemplar. Great care must be taken in fixing these ropes, for the animal is cunning and clever enough to untie most knots with its trunk.

Food is brought by the animal's future



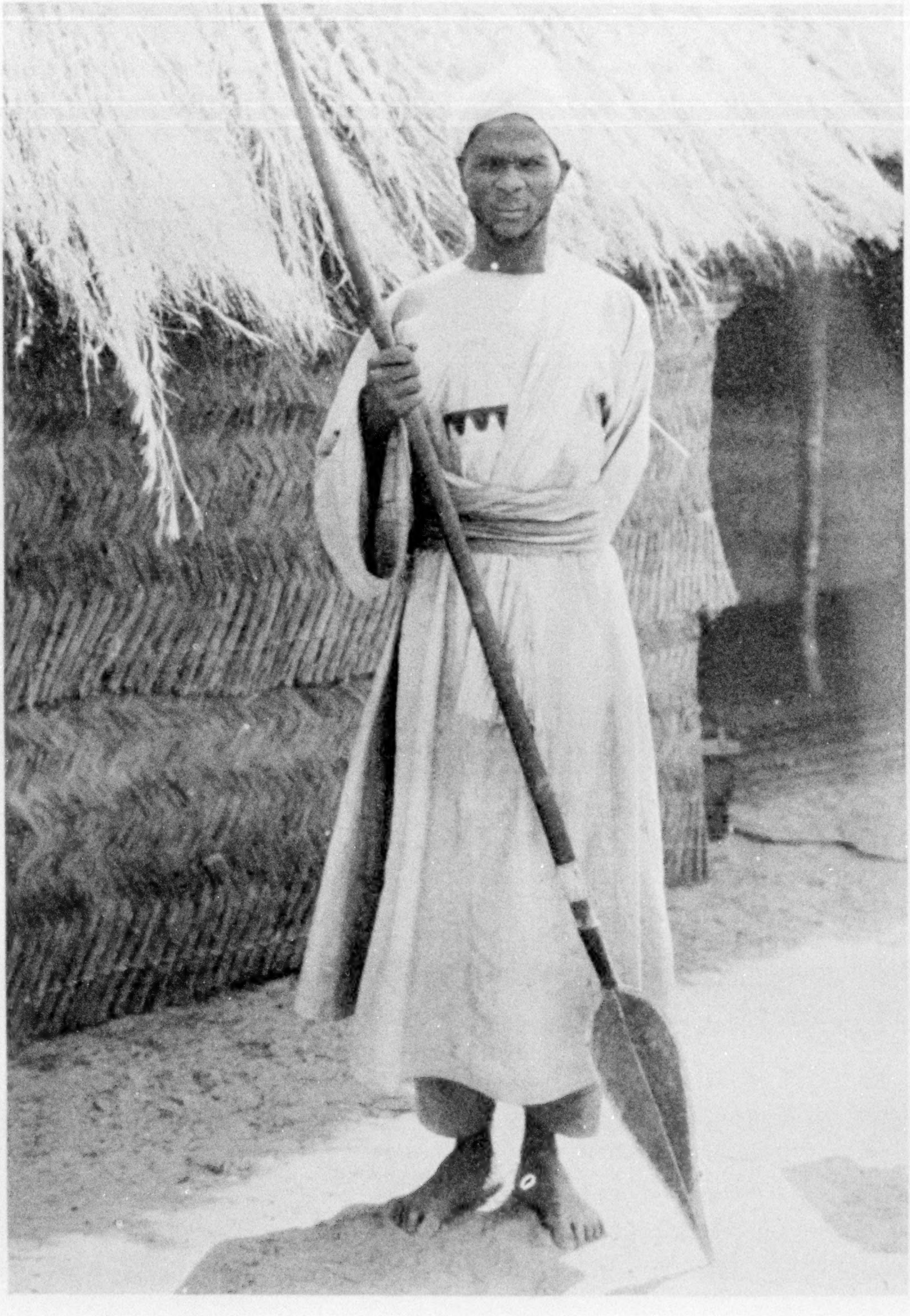
JAZZ AFRICANUS

Sara musicians can make a wicked noise with their drums and the instrument on the right, a sort of xylophone made of gourds (see text, page 660).



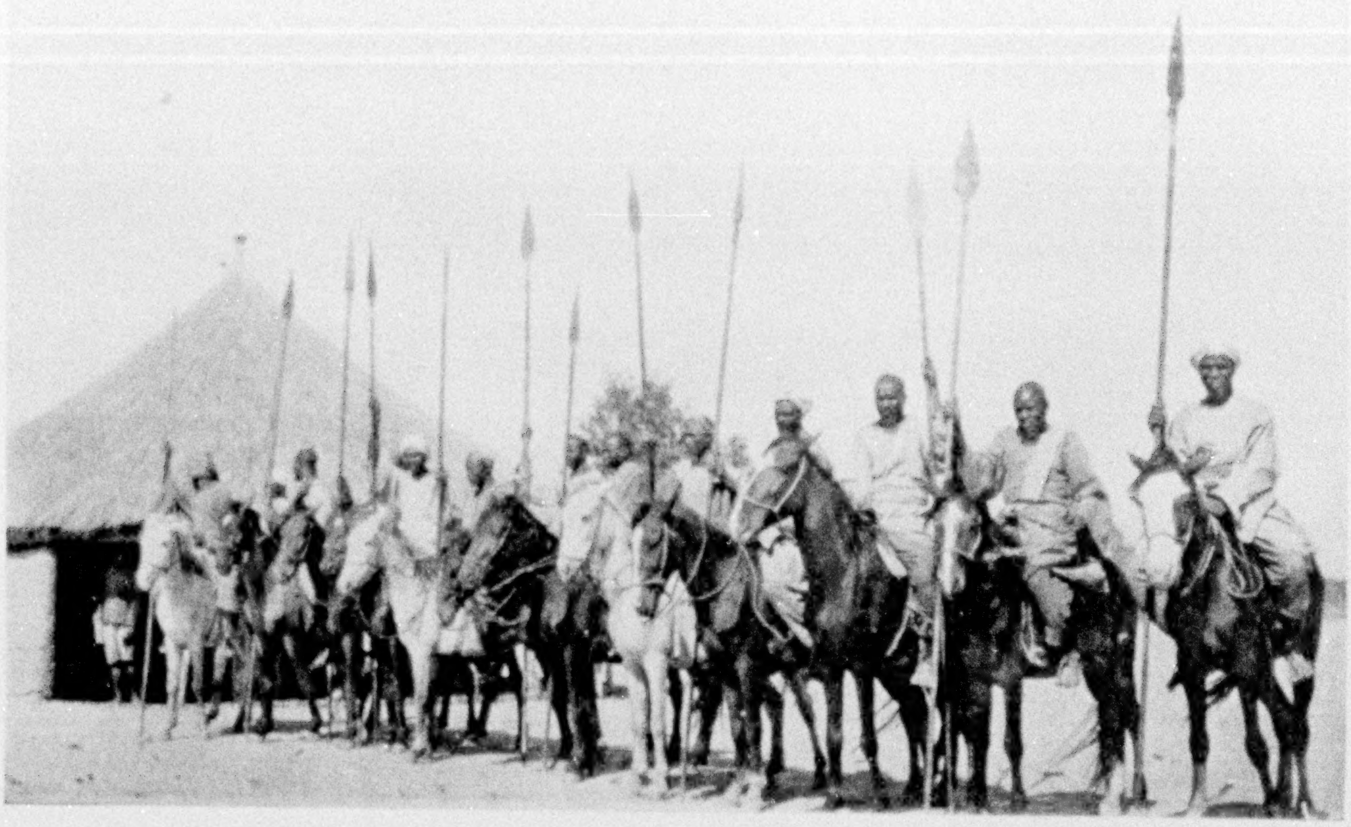
FUNERAL DANCERS

Often when a person dies in Central Africa his friends and neighbors celebrate the occasion with feasts, dances, and merrymaking in general. The ceremony sometimes continues for hours and the dancers, in a frenzy of excitement, leap into the air and strike their heads with their heels (see text, page 669).



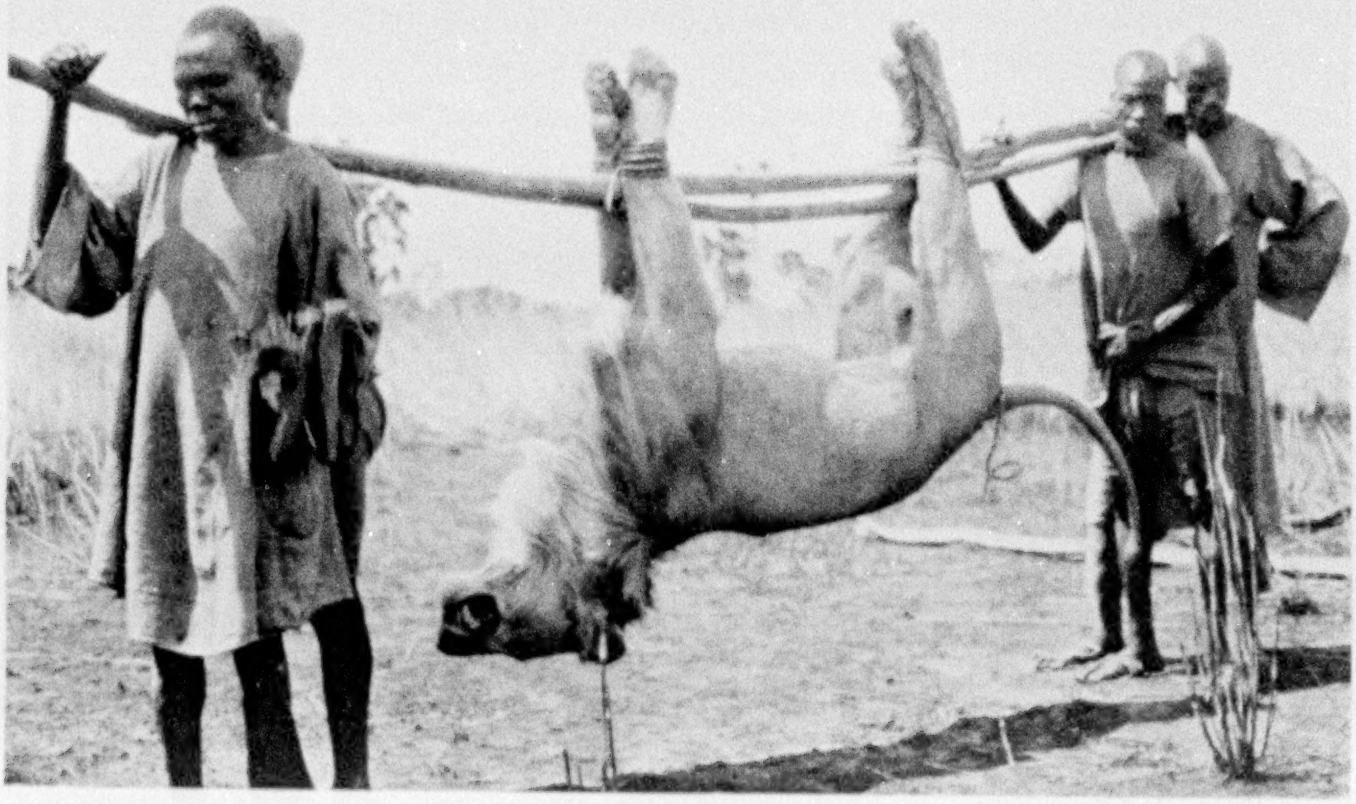
A HUNTER WITH HIS ELEPHANT SPEAR

When the author and his party went into the Am Dafok region in search of lions and elephants, they took with them a number of these half-breed hunters. The spear is of light wood and about 12 feet long. The iron head is a two-edged blade (see text, page 669).



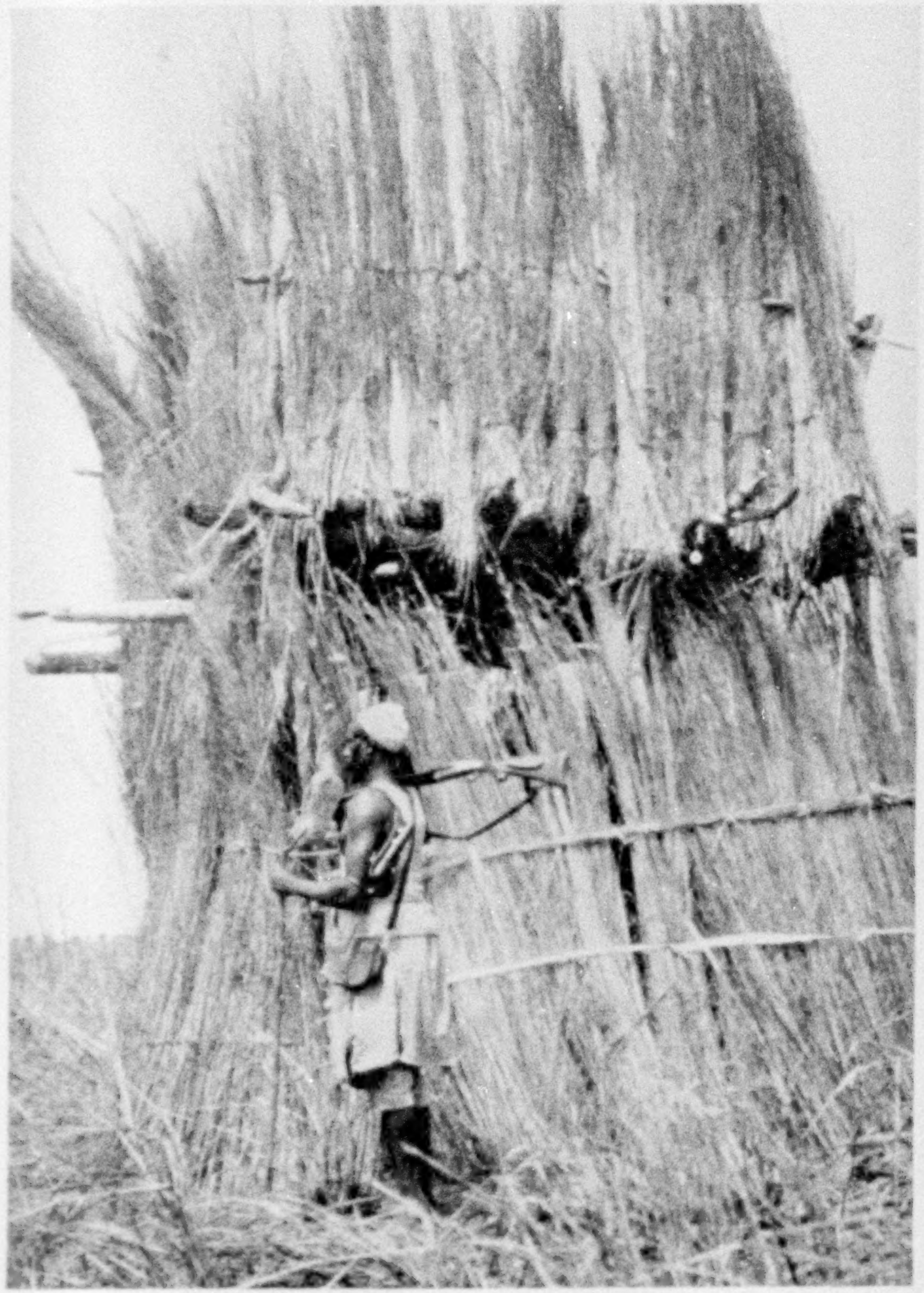
MOUNTED ELEPHANT HUNTERS

These men of mixed Arab and Negro blood attack their quarry with fire-hardened wooden spears. Their thrusts seldom kill the elephant outright, but they follow the wounded animal for days, until it drops exhausted from loss of blood (see text, page 676).

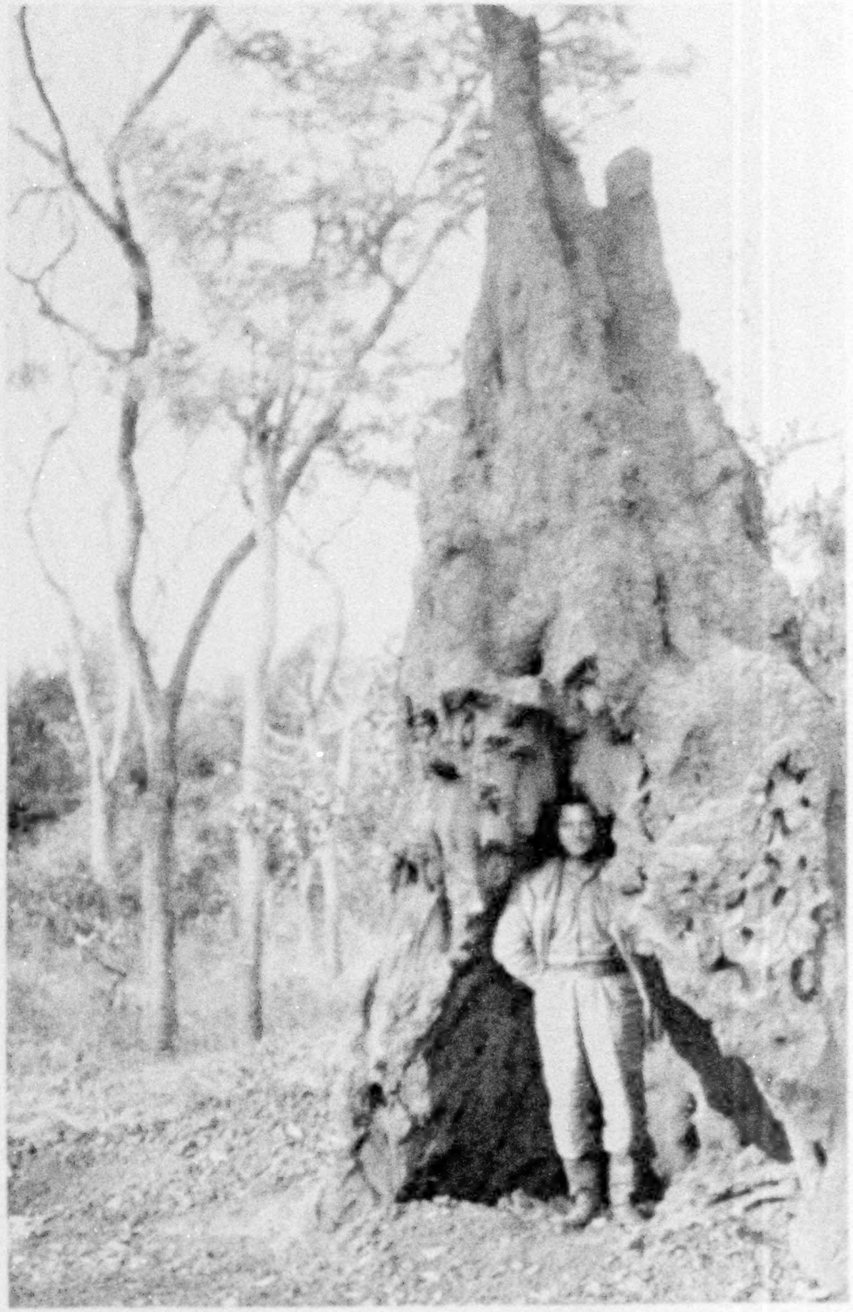


A MUSEUM SPECIMEN

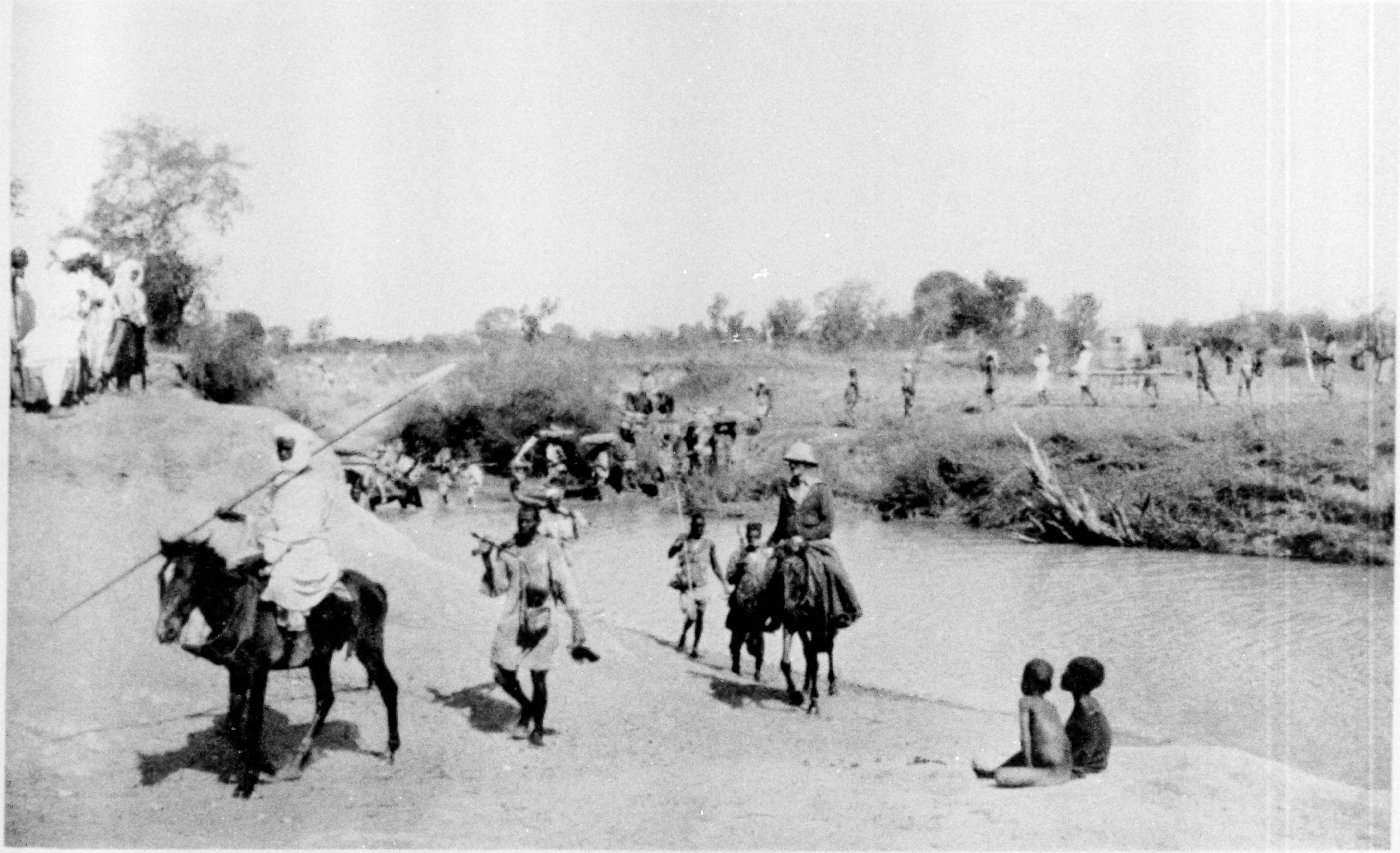
Lions, although they have been vigorously hunted, are still numerous in Central Africa. The killing of one is an occasion for great rejoicing among the natives, who live in dread of their depredations.



A NIGHT HUNTER'S BLIND IN THE AM DAFOK SWAMP

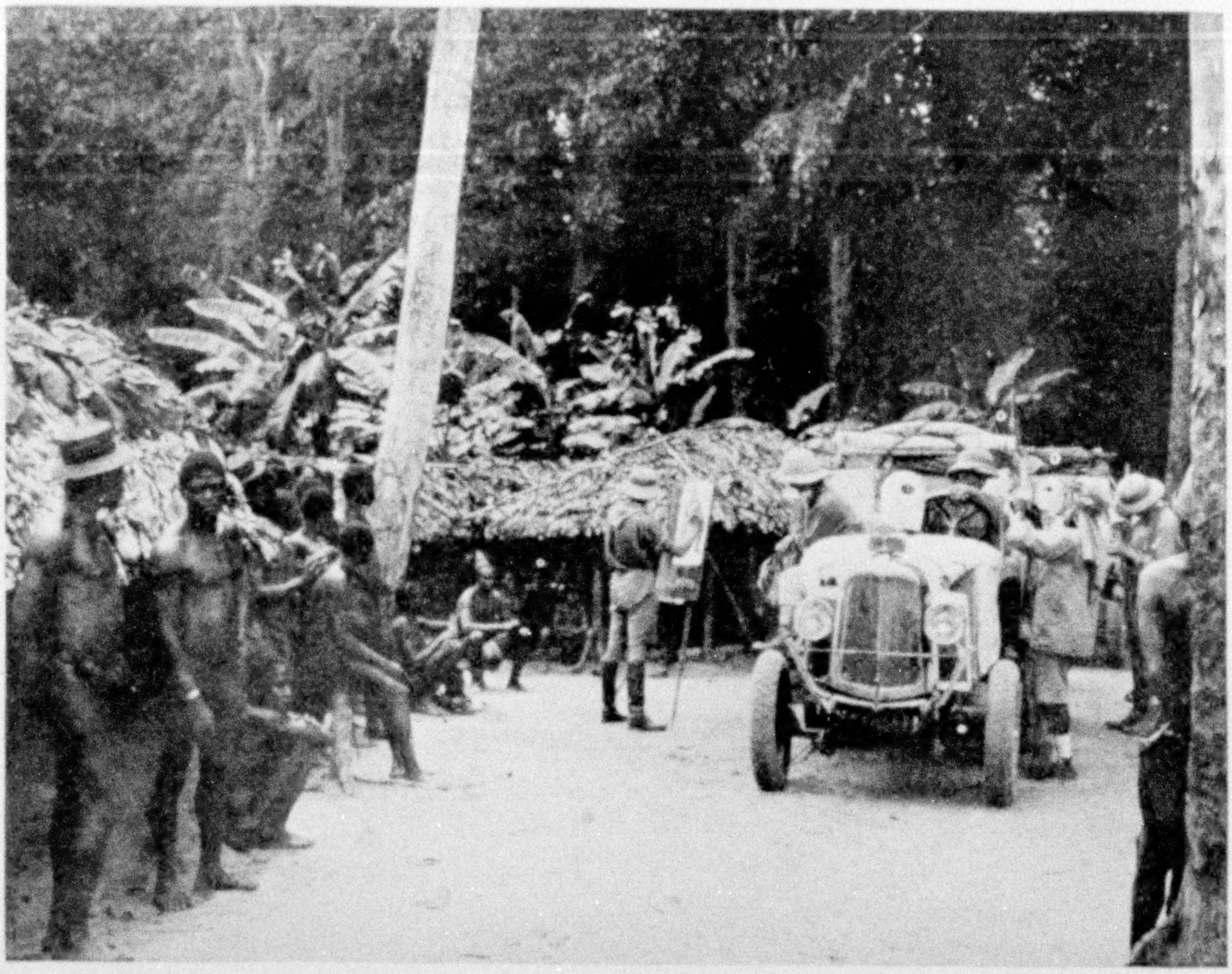


A 15-FOOT WHITE-ANT HILL



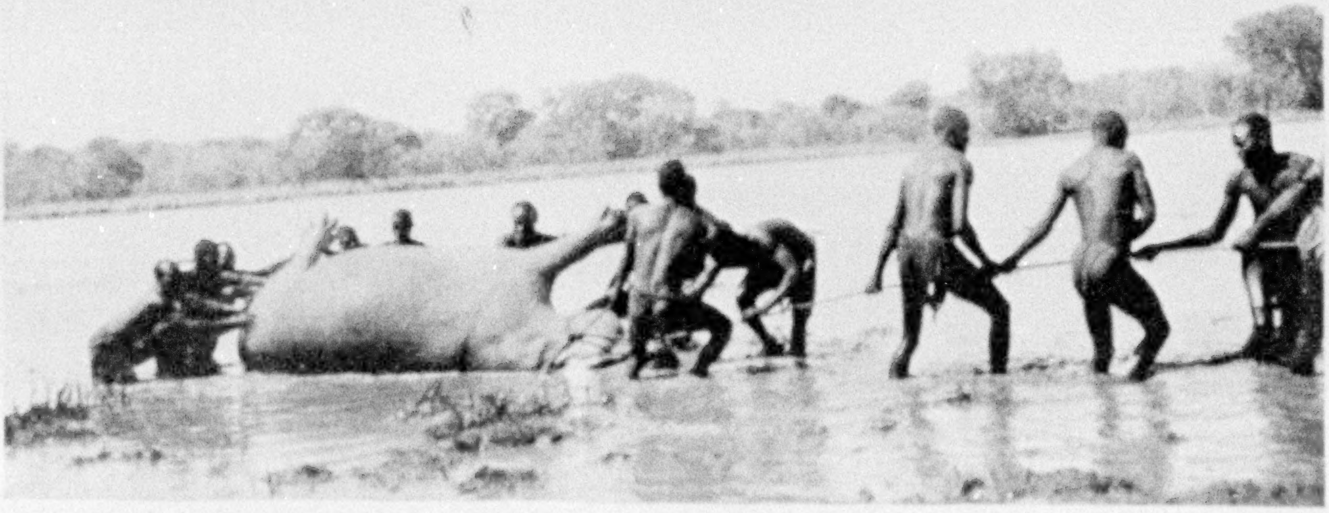
RETURNING FROM THE BIG-GAME HUNT IN THE AM DAFOK SWAMP

The safari consisted of 120 people and spread out along the bush trail like a giant serpent. The mounted man on the left is one of 20 native expert hunters (see text, pages 676-677).



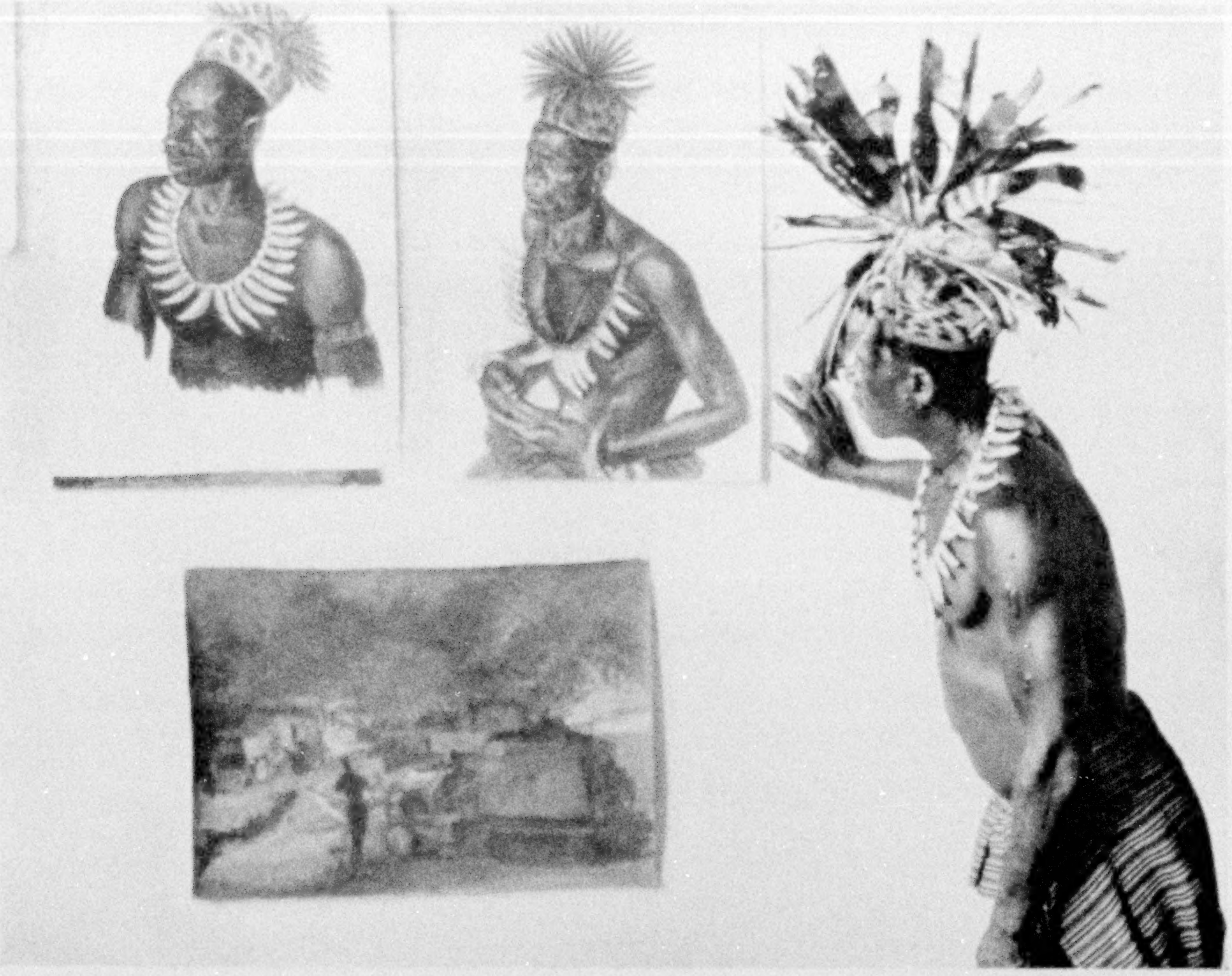
IN THE GREAT EQUATORIAL FOREST, A REGION OF ETERNAL TWILIGHT

The artist of the Expedition is sketching a native chief (see opposite page).



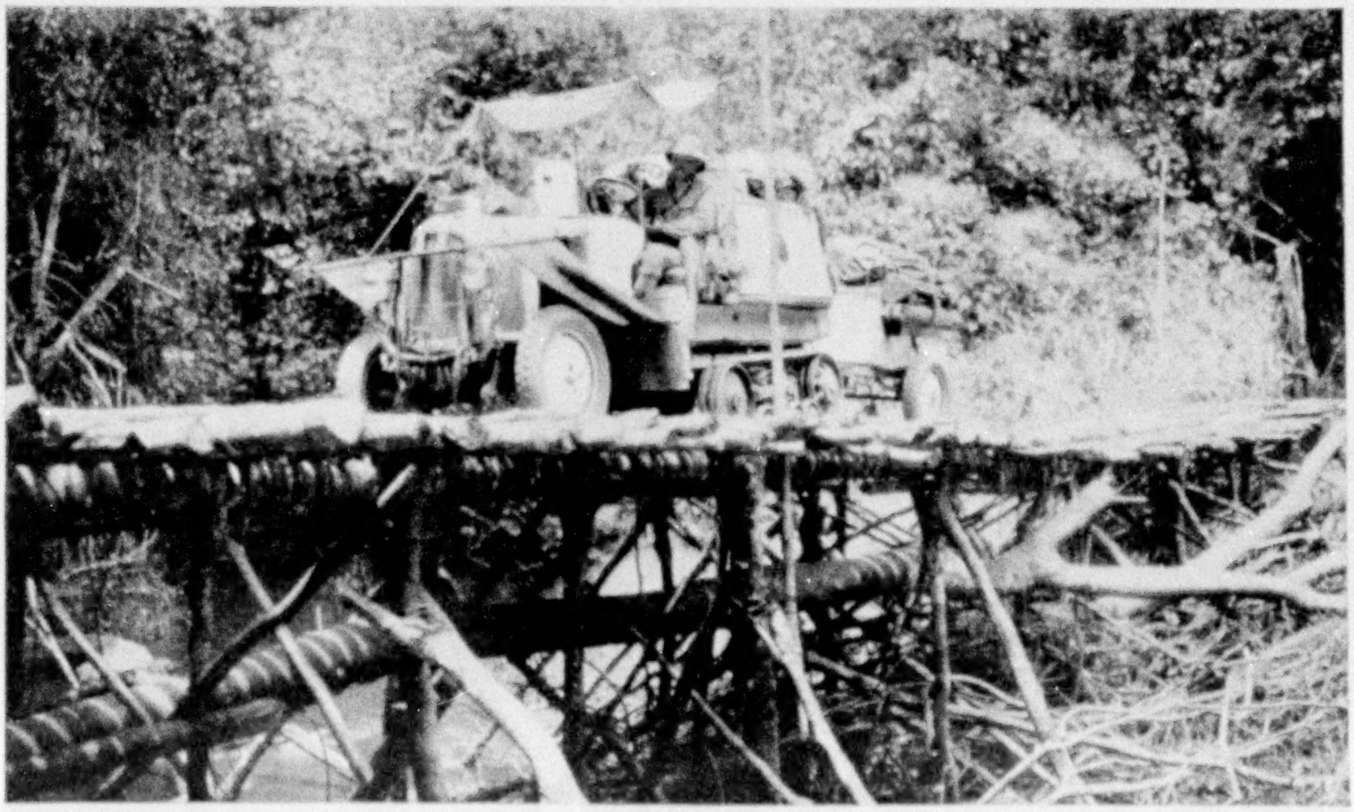
HIPPO MEAT

When a hippopotamus is mortally wounded it makes for the water and submerges, but by the next morning it usually is found floating "toes up." The natives drag it out and a feast of several days' duration begins.



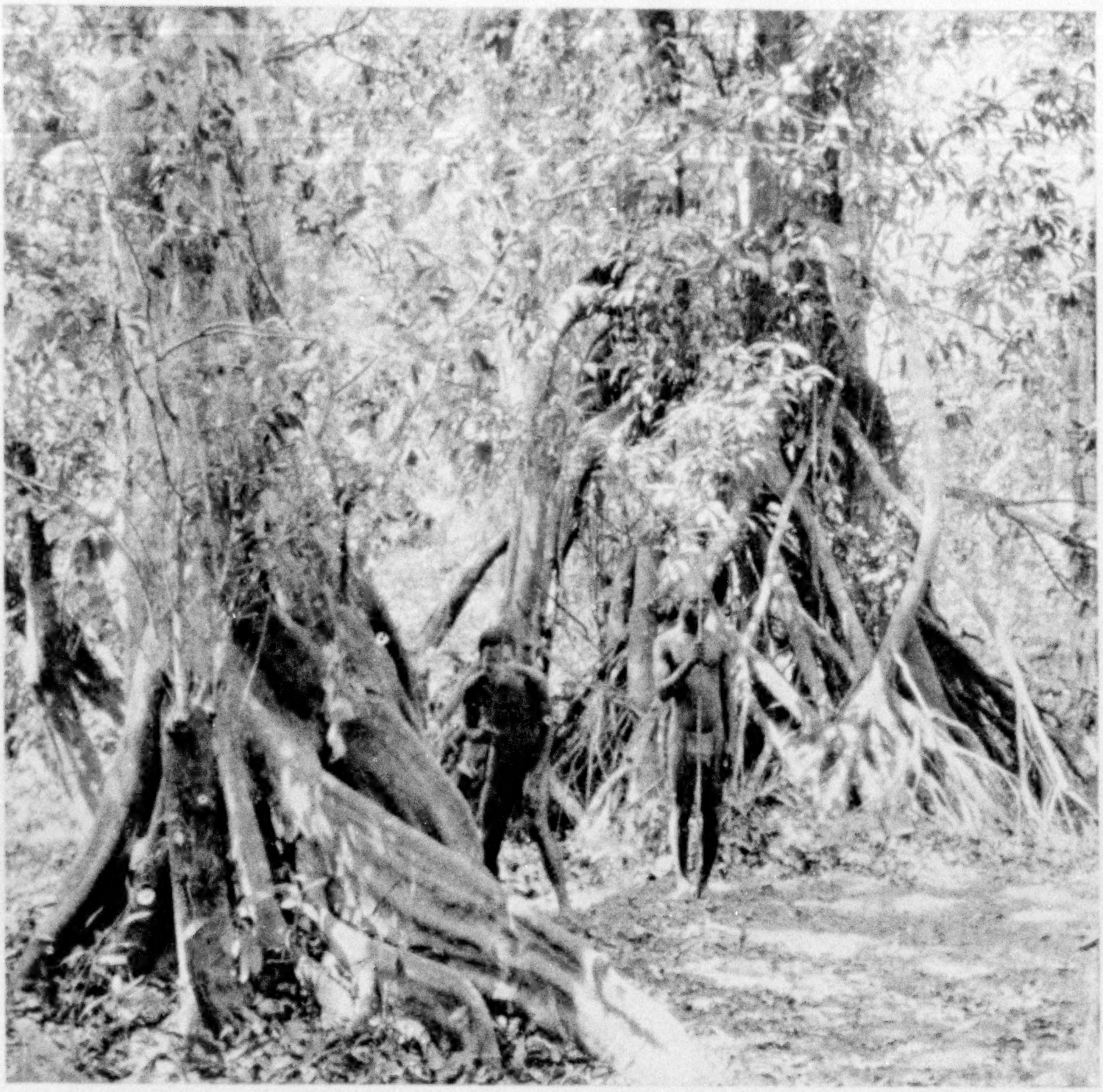
SEEING HIMSELF AS OTHERS SEE HIM

This Congo chieftain is looking at his own portrait, sketched at Stanleyville by M. Jacovleff.



A BRIDGE IN THE EQUATORIAL FOREST (SEE TEXT, PAGES 692-693)

Many stretches of the Congo region would have been impassable for the Expedition except for the hearty coöperation of the Belgian authorities, who in less than one month cut a track 375 miles long through the forest, 40,000 natives being employed at the task.



DENIZENS OF THE EQUATORIAL FOREST

"What surprised us most in the great forest was its silence. We had supposed there would be a noisy and entertaining animal life, but not a bird call or a monkey yell broke the stillness" (see text, page 692).

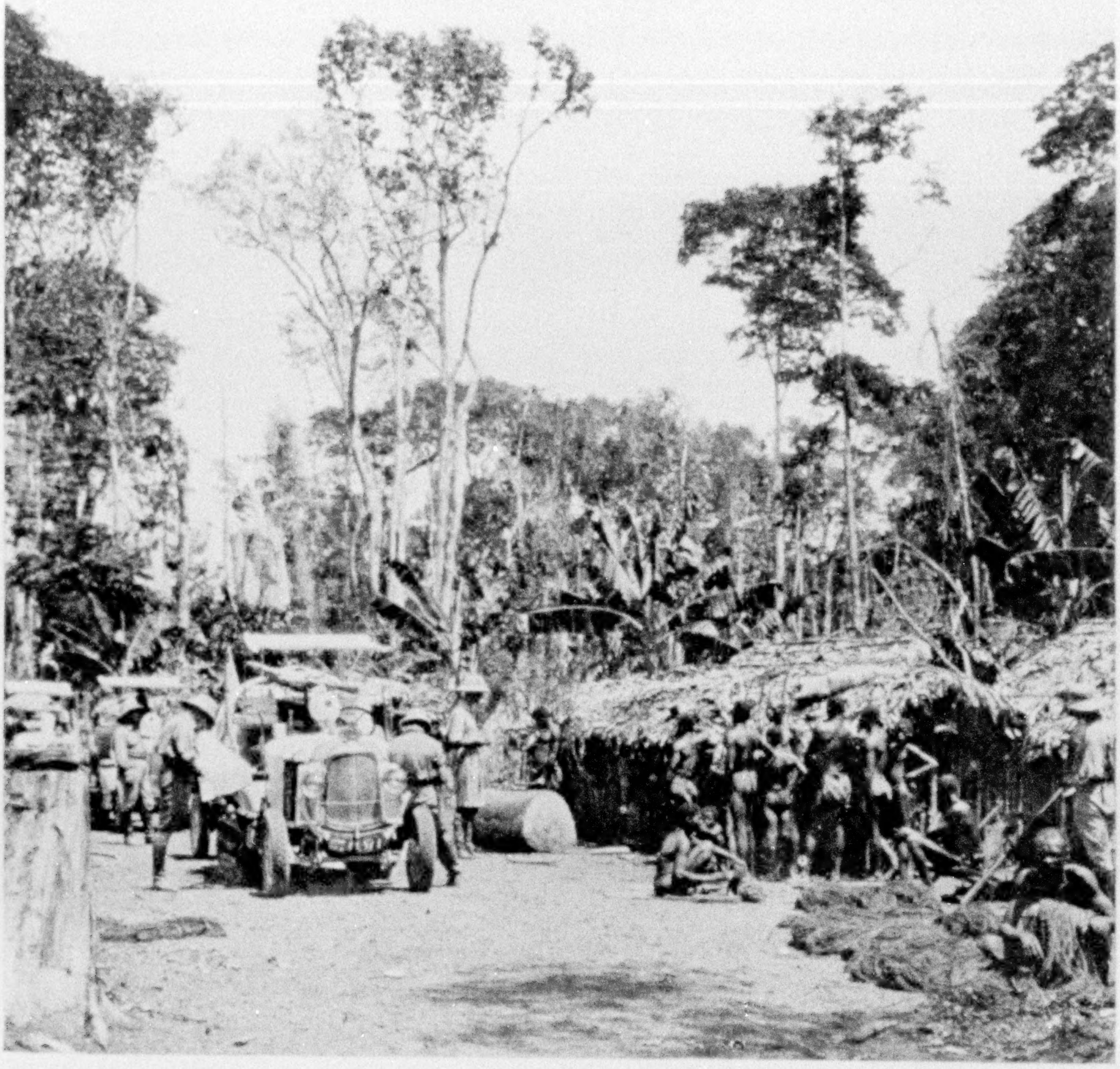
human guardian, who remains near him, perfectly quiet, in order that the elephant may get thoroughly accustomed to his presence.

Later on this same man takes up a palm, with which he gently pats the animal's neck. This often precipitates a display of nerves; but the man then starts to croon a strange native melody, which seems to have the effect of a lullaby. The elephant quickly responds to its soothing effect and becomes quiet again. After this process has been repeated day after day for some time, the animal permits the nearer approach of its trainer and soon it is comparatively tame.

When adjudged sufficiently domesticated, the elephants are taught to pull up and transport trees, to plow, and to drag heavy cars (see illustration, page 706).

### TRIBE OF NYANGARA DISTRICT DEFORMS SKULLS OF ITS INFANTS

The Mangebetou whom we encountered in the Nyangara region have an odd way of dressing their hair, with the result that the skulls of both men and women are distorted and drawn backward. When they are still small children their heads are tied up with narrow bands made of giraffe hide and hair. As the heads grow larger and longer, new bands are added,



SENDING A MESSAGE VIA NATIVE AFRICAN "RADIO"

The author, standing in the center of the picture, is requesting a native operator to send a message on ahead for him. The instrument used is the *goudougoudou*, or signal drum. By means of a code, the natives can relay messages over long distances in a very short time. The drum may be heard from six to ten miles (see text, page 693).

until the result is quite astounding (see illustrations, pages 711, 713, and 715).

When the women marry, later on, they set their hair on a wire or wooden mounting, which gives them the appearance of wearing a sort of permanent halo of hairy glory around their heads.

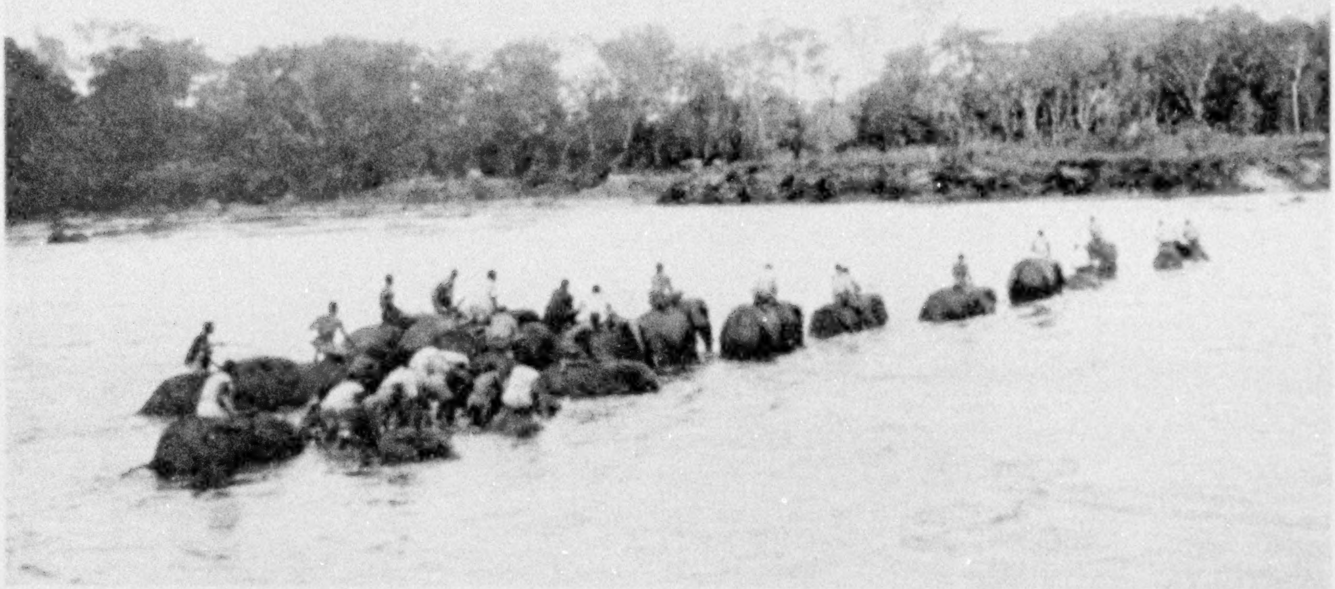
### EXPEDITION SPLITS INTO FOUR PARTIES

Lake Victoria, which we reached on April 20, marked the parting of the ways for our Expedition. In deference to a request from the President of France, we decided to pursue several of the known routes from the Great African lakes to the Indian Ocean and Madagascar.

From Kampala two cars set out to try to reach Mombasa by way of the Ripon Falls, Nairobi, Mount Kilimanjaro (the highest mountain in Africa), and Tanga.

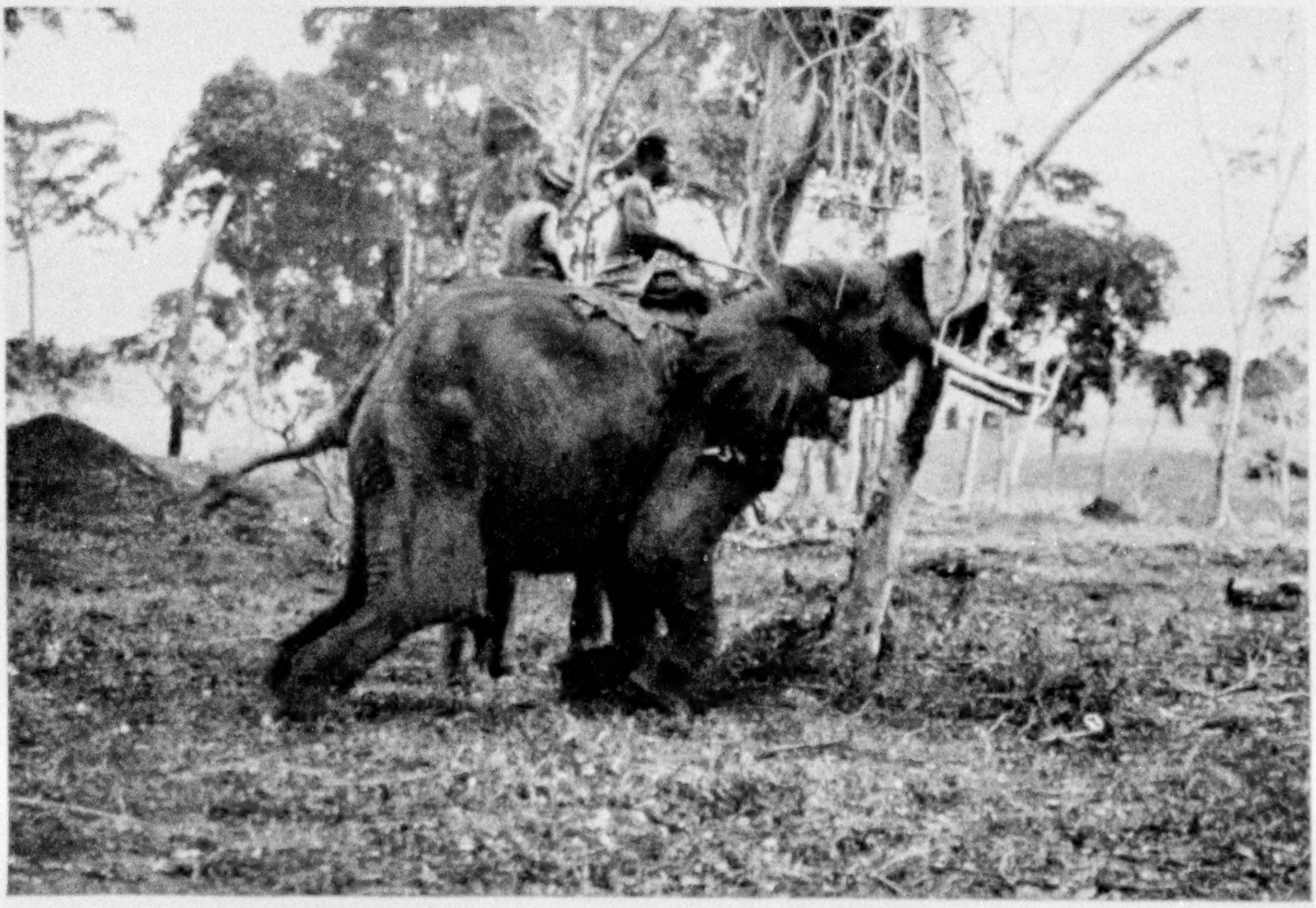
Our six remaining cars embarked on Lake Victoria en route to Tabora, some distance south. There two cars set out for Dar-es Salaam through the Tanganyika Territory, following the route that Stanley passed over when he left Bagamoga in search of Livingstone.

The last section to break away consisted of two cars which proceeded toward Cape Town via the Belgian Congo and Lake Tanganyika, passing through Ujiji at the very place where Stanley

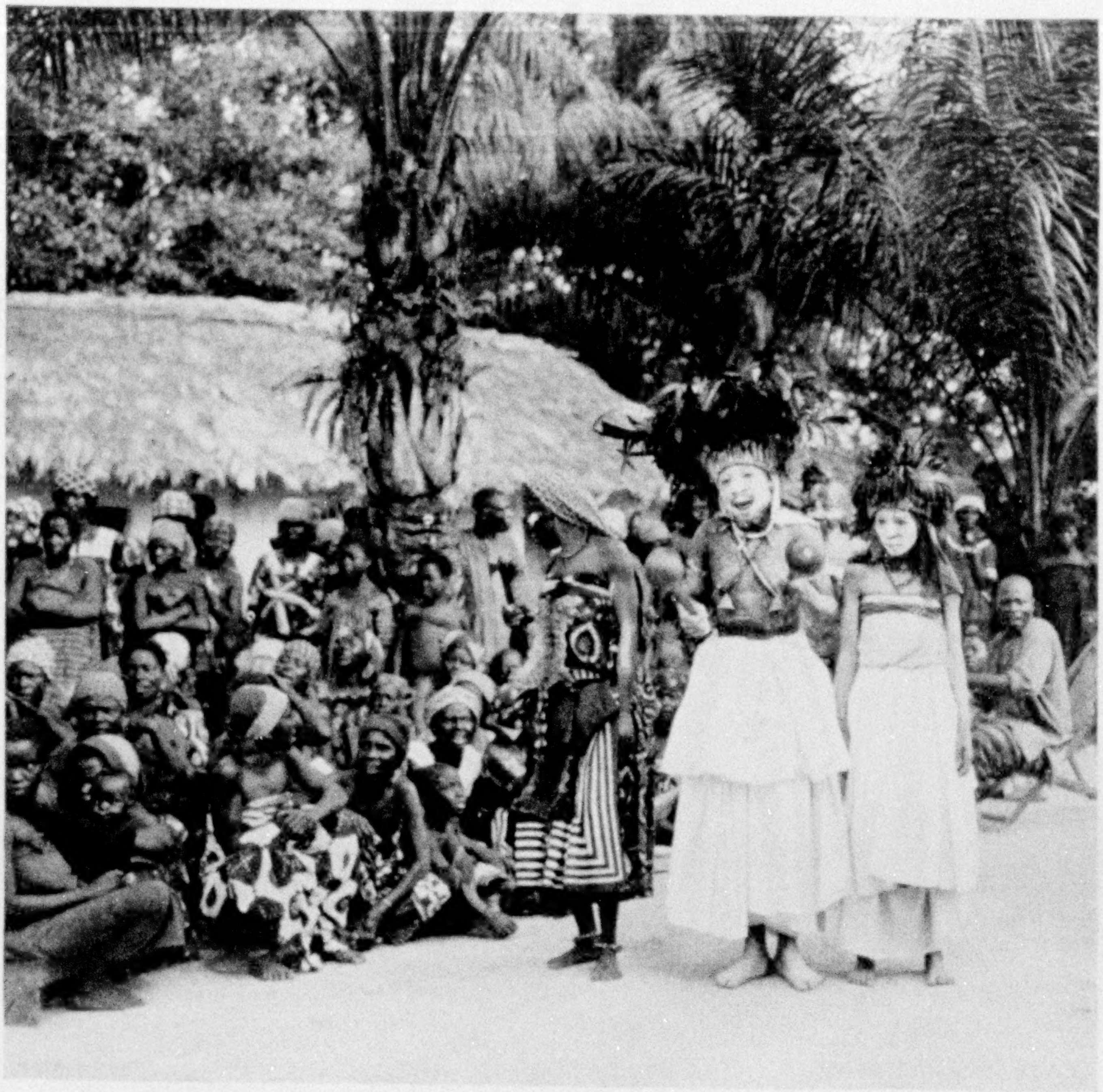


OUT FOR THEIR DAILY BATH

Every afternoon, at the Belgian Elephant Training Station at Api, in the Congo, the animals are led into the river to bathe, and the one which goes farthest receives a lump of salt from the keeper, who is in a canoe close by. When they leave the water they roll in the sand and mud to coat themselves with a protection against insects (see text, page 696).



SOLVING THE LABOR PROBLEM IN THE CONGO



CHARM DOCTORS ABOUT TO DANCE

The white-faced pair at the right will first smear themselves with the blood and brains of a fowl, and then proceed to cavort until they fall prostrate on the ground. These sorcerers often become rich through the sale of amulets and charms to their tribespeople.

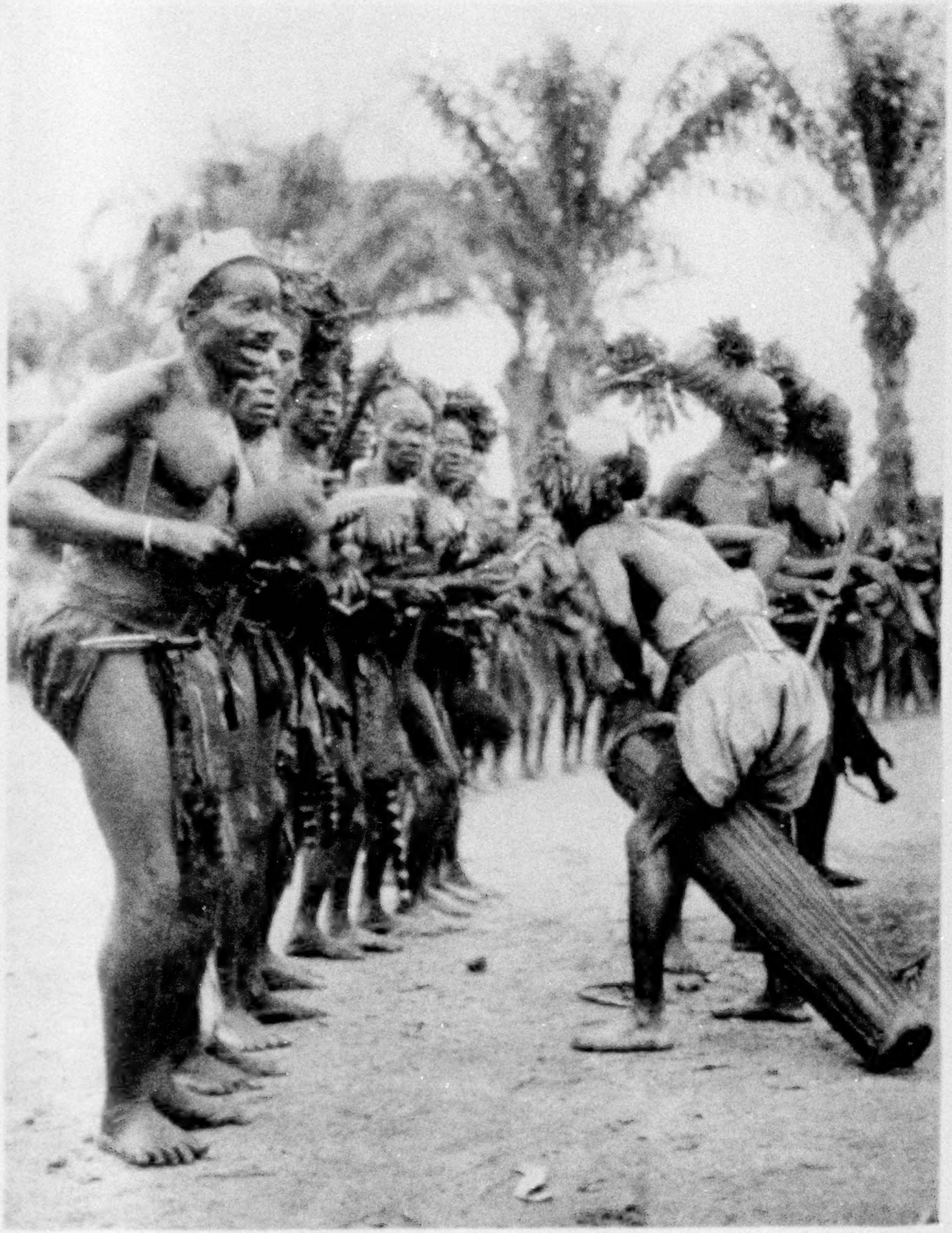
found Livingstone. They completed their journey successfully, but, due to the greater distance covered, it took them nearly two months longer than any of the other parties to reach their destination.

### A HAZARDOUS FERRY RIDE

My own car and one other, the only remaining units of the original Expedition, set out for Mozambique. We encountered many difficulties in crossing swamps and rivers in this part of the country. At the Ruaha River (200 feet wide and 15 feet deep) our only means of crossing was on an improvised ferry made of three leaky native pirogues connected by boards (see illustration, page 718).

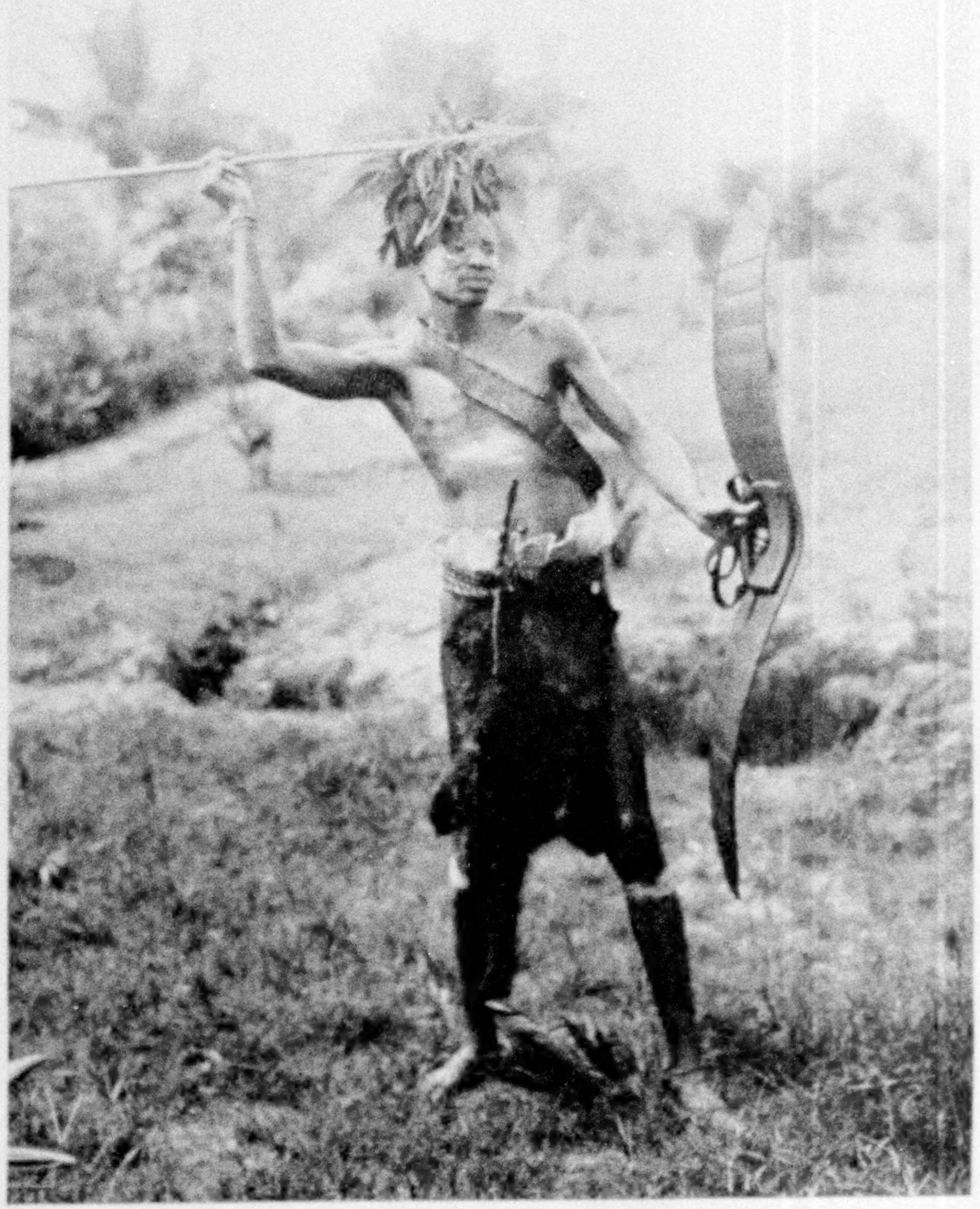
When our first car was placed on it the crazy craft was only about two inches out of the water, and it filled so rapidly that three men had constantly to bail at full speed to prevent the whole contrivance from going to the bottom. Indeed, only by superhuman efforts and great good luck did our second car escape a watery grave. The ferry sank almost immediately after this second car was landed.

We finally arrived on the shores of Lake Nyasa, where we saw a peculiar phenomenon. Great clouds seemed to rise from the surface of the lake, glittered a moment in the sun, and then suddenly disappeared. We discovered that these



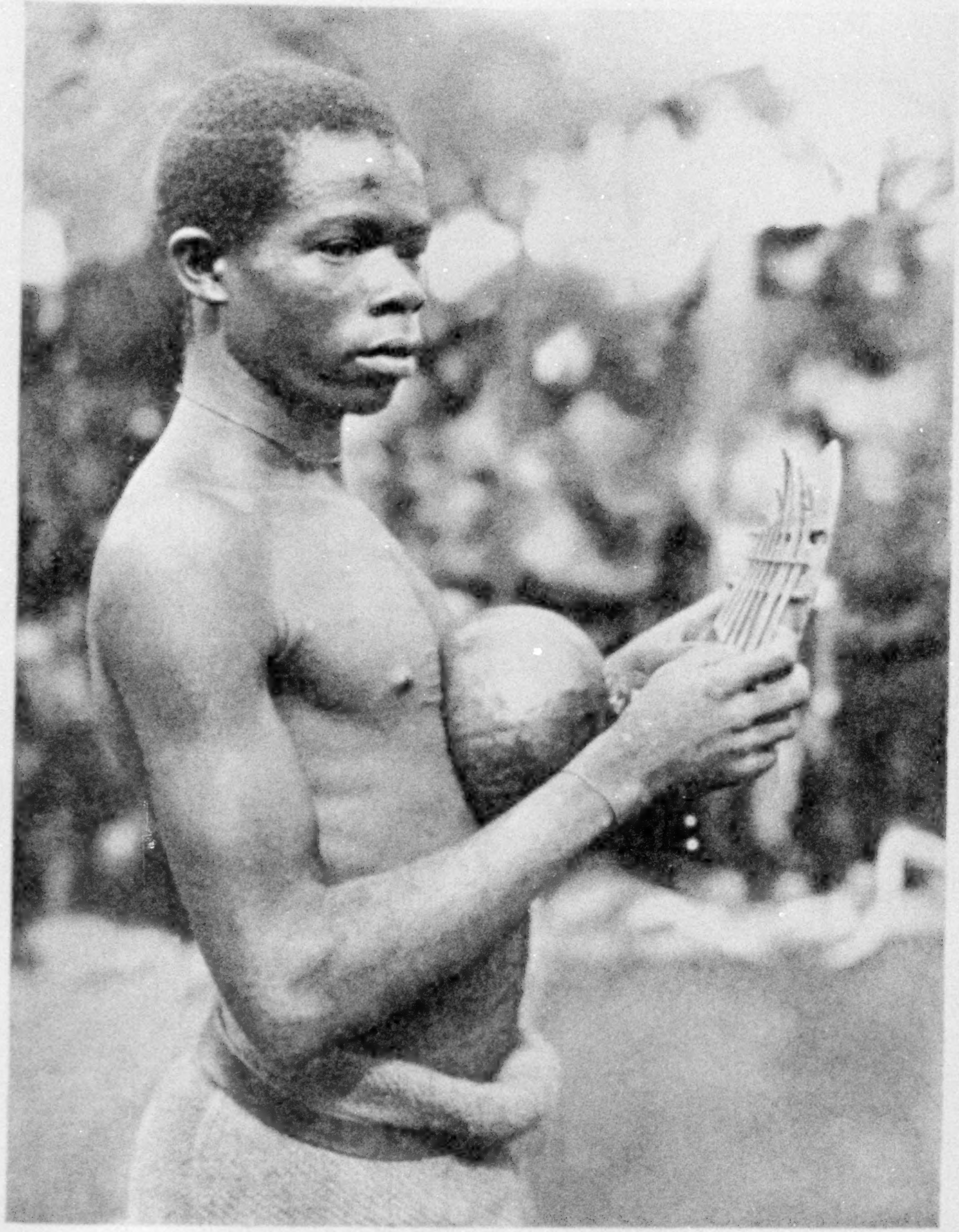
AN ABABUA MALE CHORUS

Singing and dancing are popular pastimes with this tribe. The orchestra is in front, astride his drum.



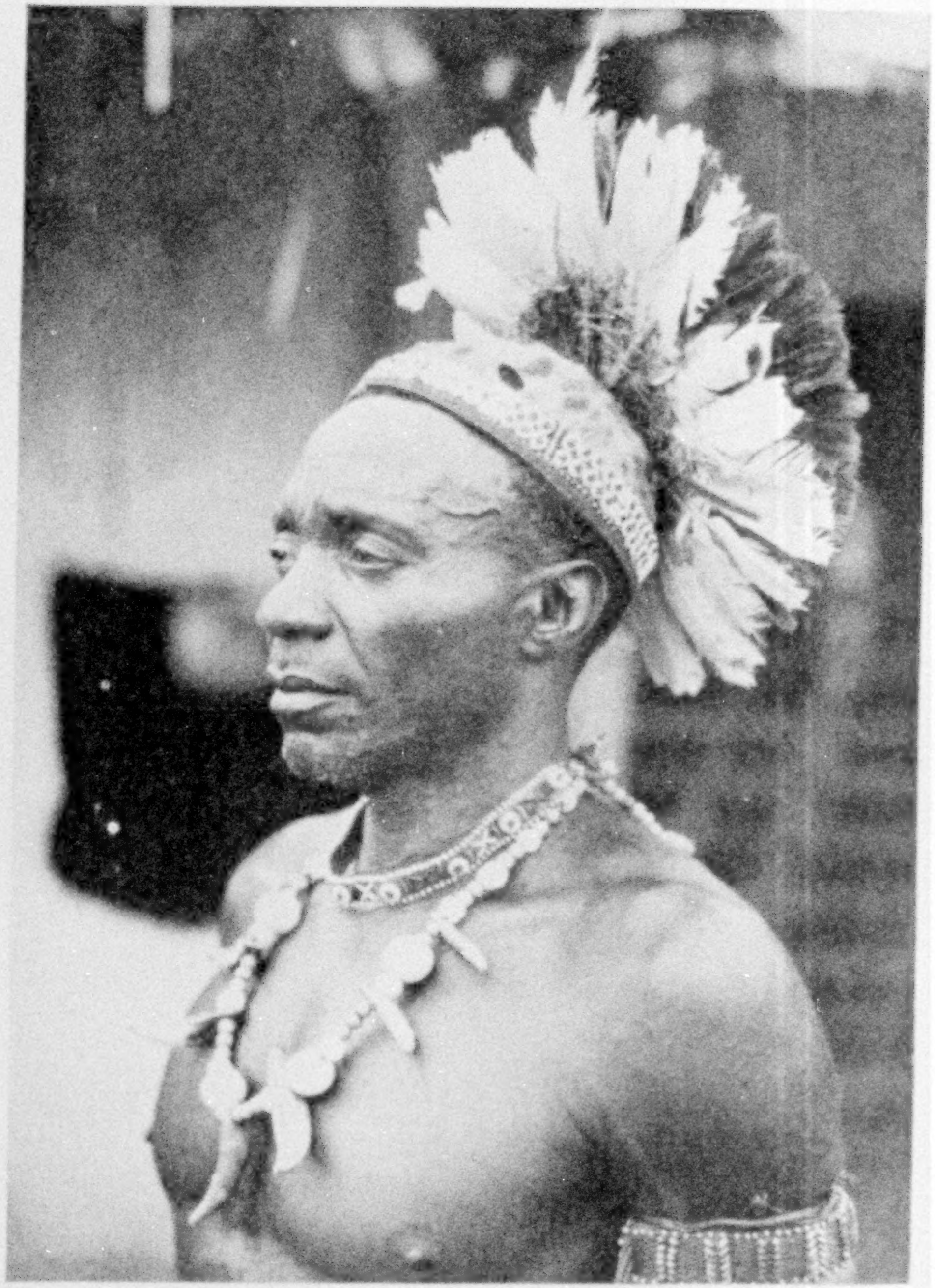
ON GUARD

The African warrior makes himself appear as hideous as possible, daubing his face and body with ocher, white clay, and ashes.



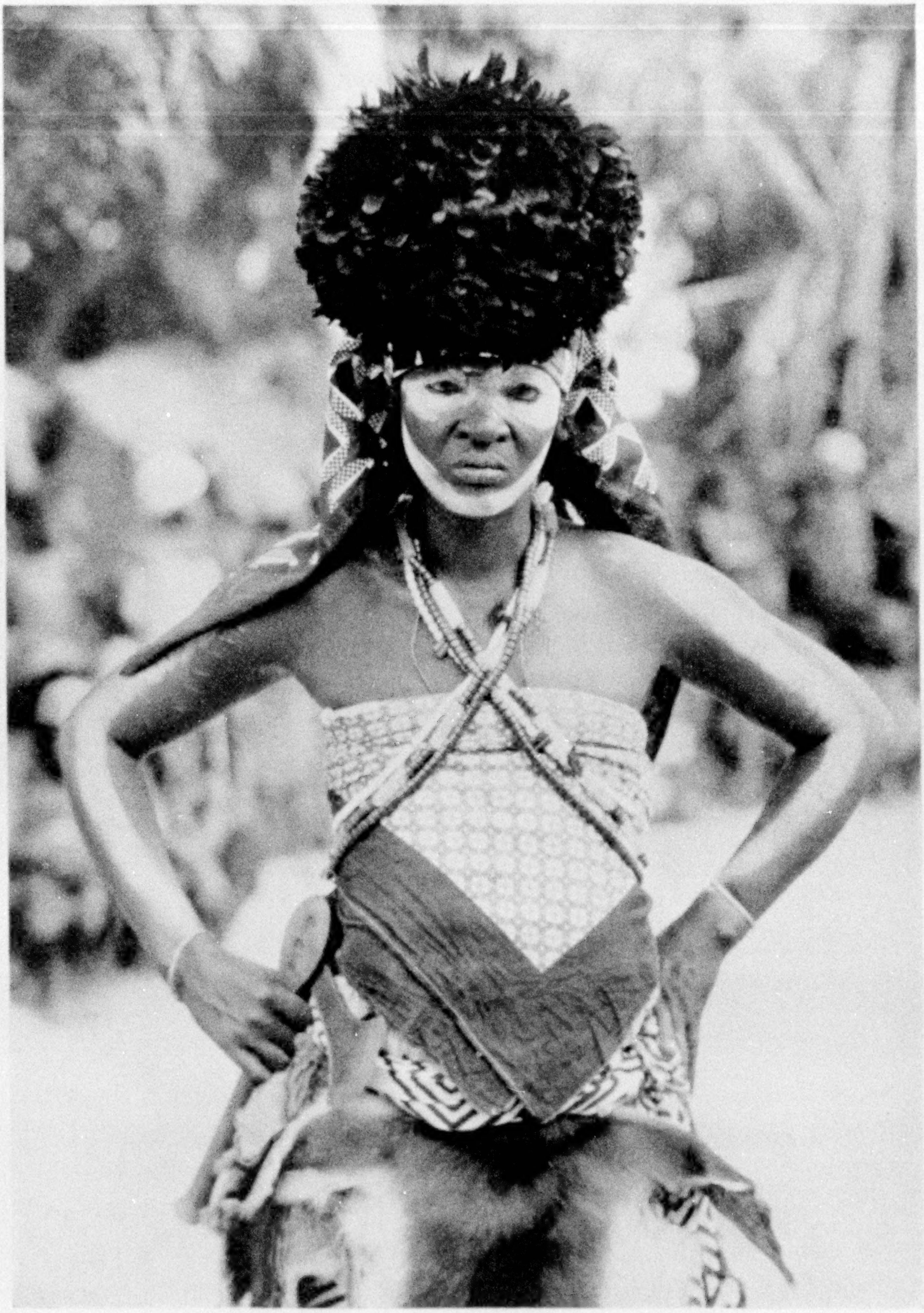
A PIANIST OF CENTRAL AFRICA

The sounding box of this unique instrument is a gourd and its strings are slips of bamboo. A pleasing musical effect is obtained by a good performer.



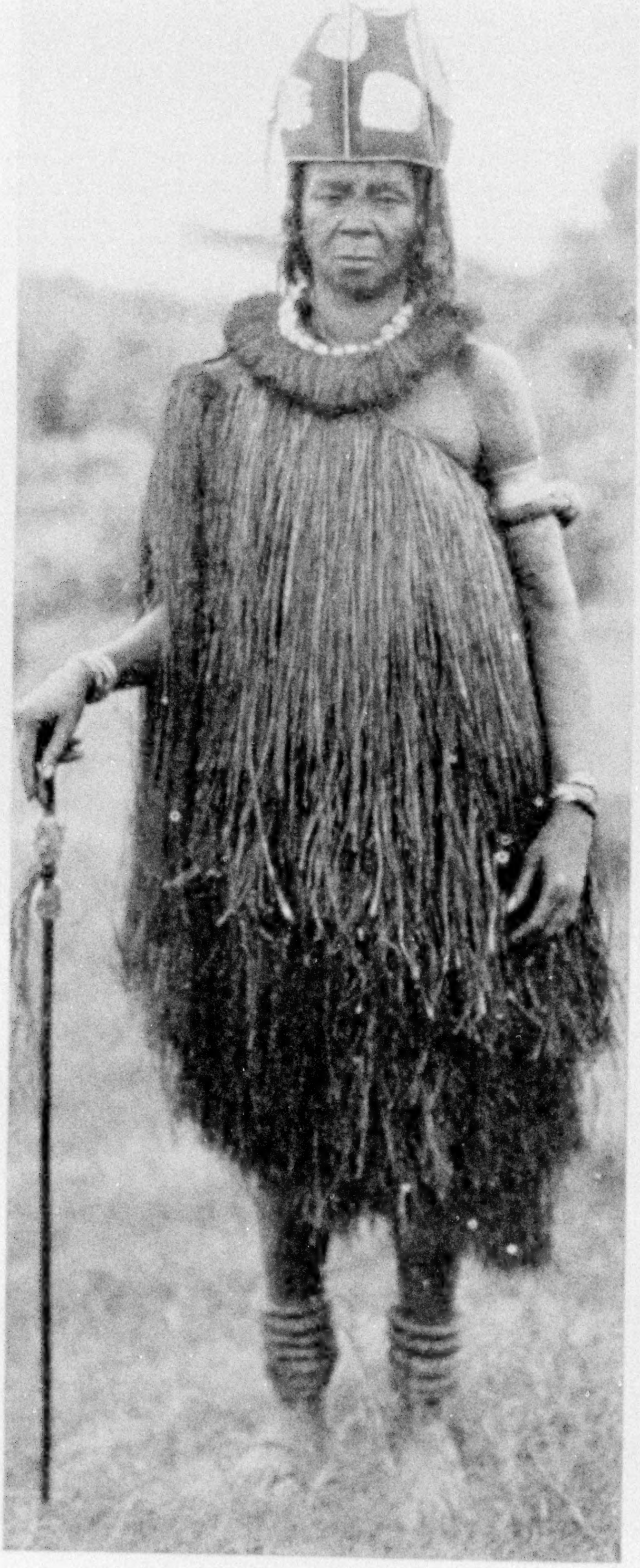
ROBED FOR MAGISTERIAL DUTIES

Native chiefs act as judges in purely native disputes. The headdress and a loin cloth constitute the "judicial wig and robe," while the necklace is the badge of authority (see text, page 696).



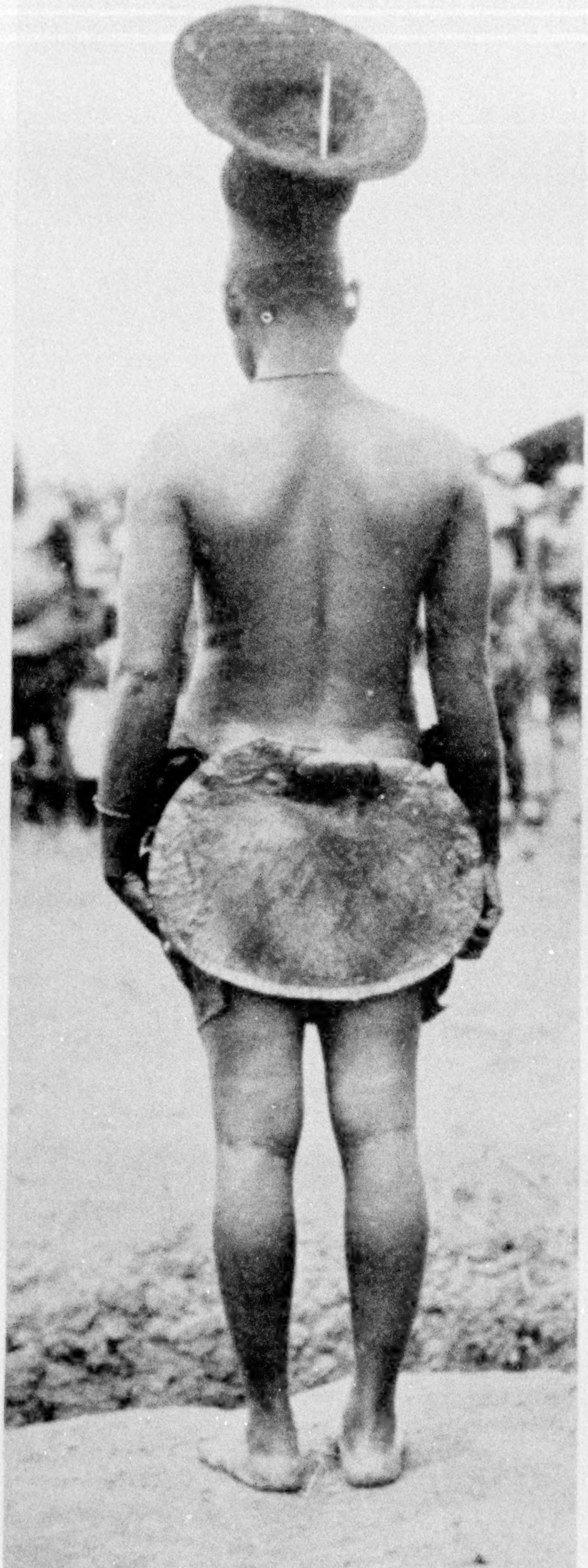
NGANGA NKISSI—THE WITCH DOCTOR: STANLEYVILLE

Probably no single force has done more to keep the people of Central Africa steeped in ignorance and superstition than has the witch doctor. Usually more quick-witted and intelligent than the other villagers, "Nganga Nkissi," fantastically dressed, and smeared and bedaubed with paint and blood, claims to have direct communication with "Ndoki," the Great Evil Spirit. Since the people live in constant fear of evil spirits, one who can control them is naturally a person of importance.



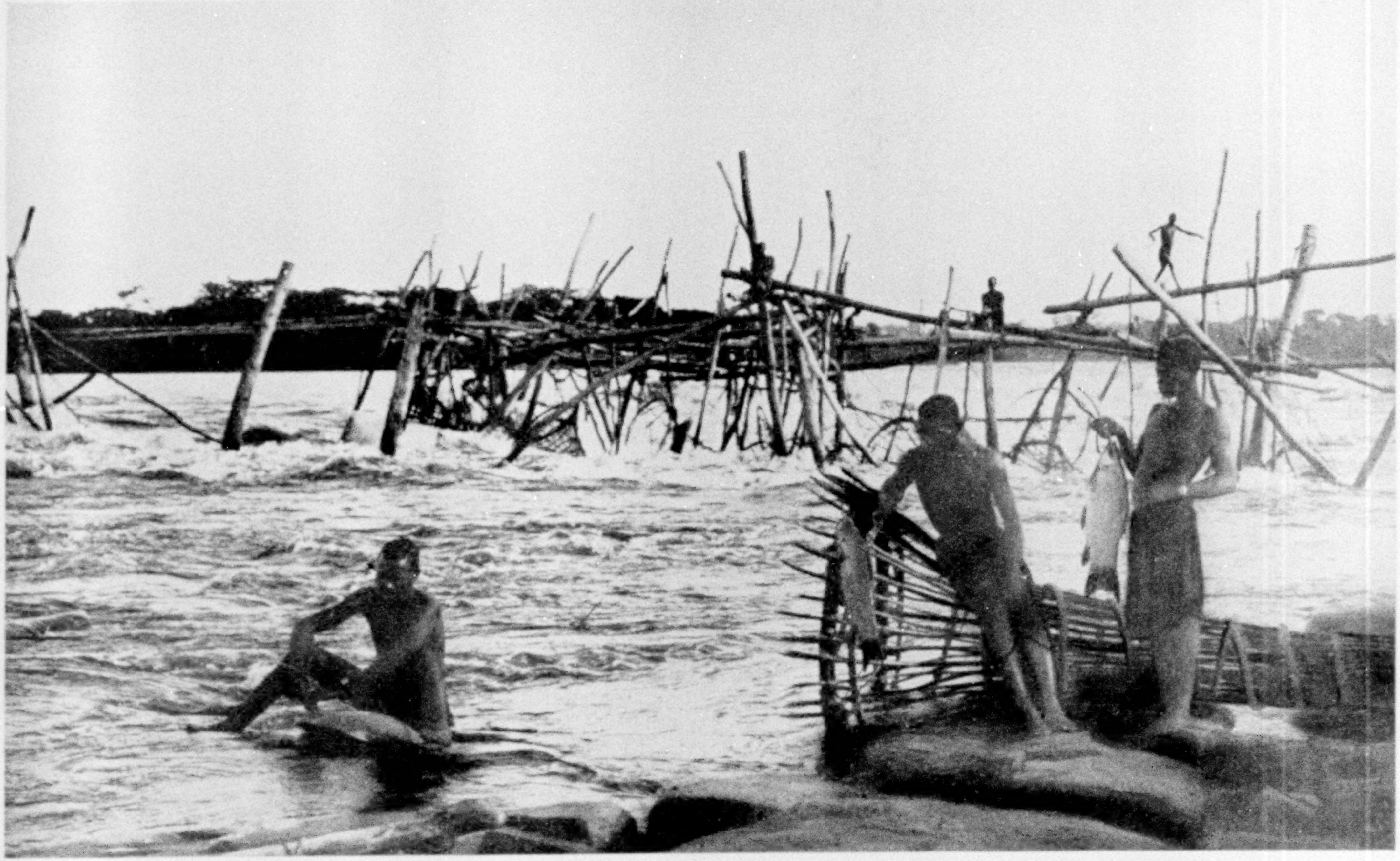
A SORCERESS DRESSED IN RAFFIA

This venerable native lives in Bengamisa, a village 30 miles north of Stanleyville. Her people were among the great army of blacks employed by the Belgians in hewing a way through the jungle for the Expedition (see pages 692-693).



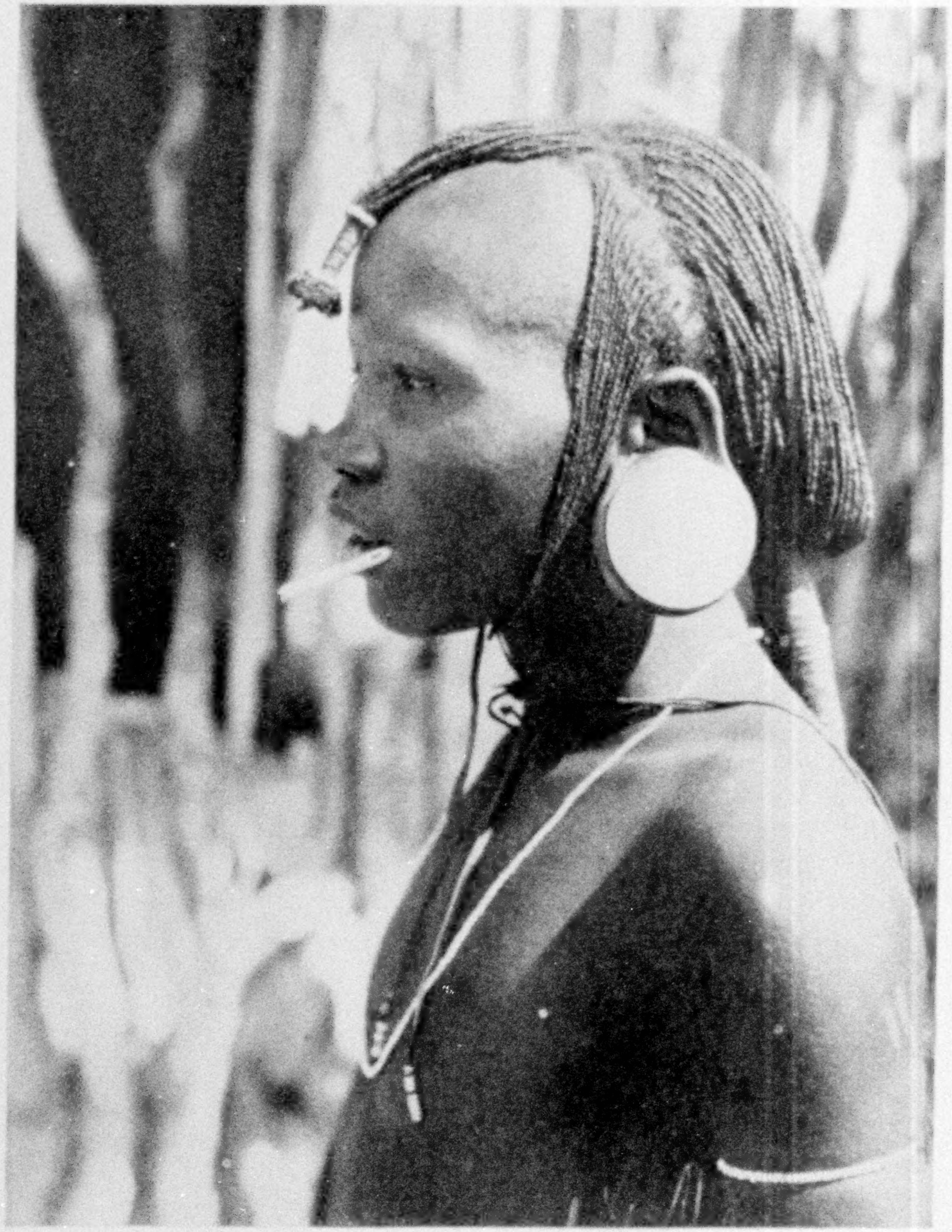
A COIFFURE À LA MANGEBETOU

The hair is twisted into a great number of thin plaits, then arranged over a light wooden framework not unlike a basket. The process is both long and tedious. Mangebetou women take great pride in manicuring their nails

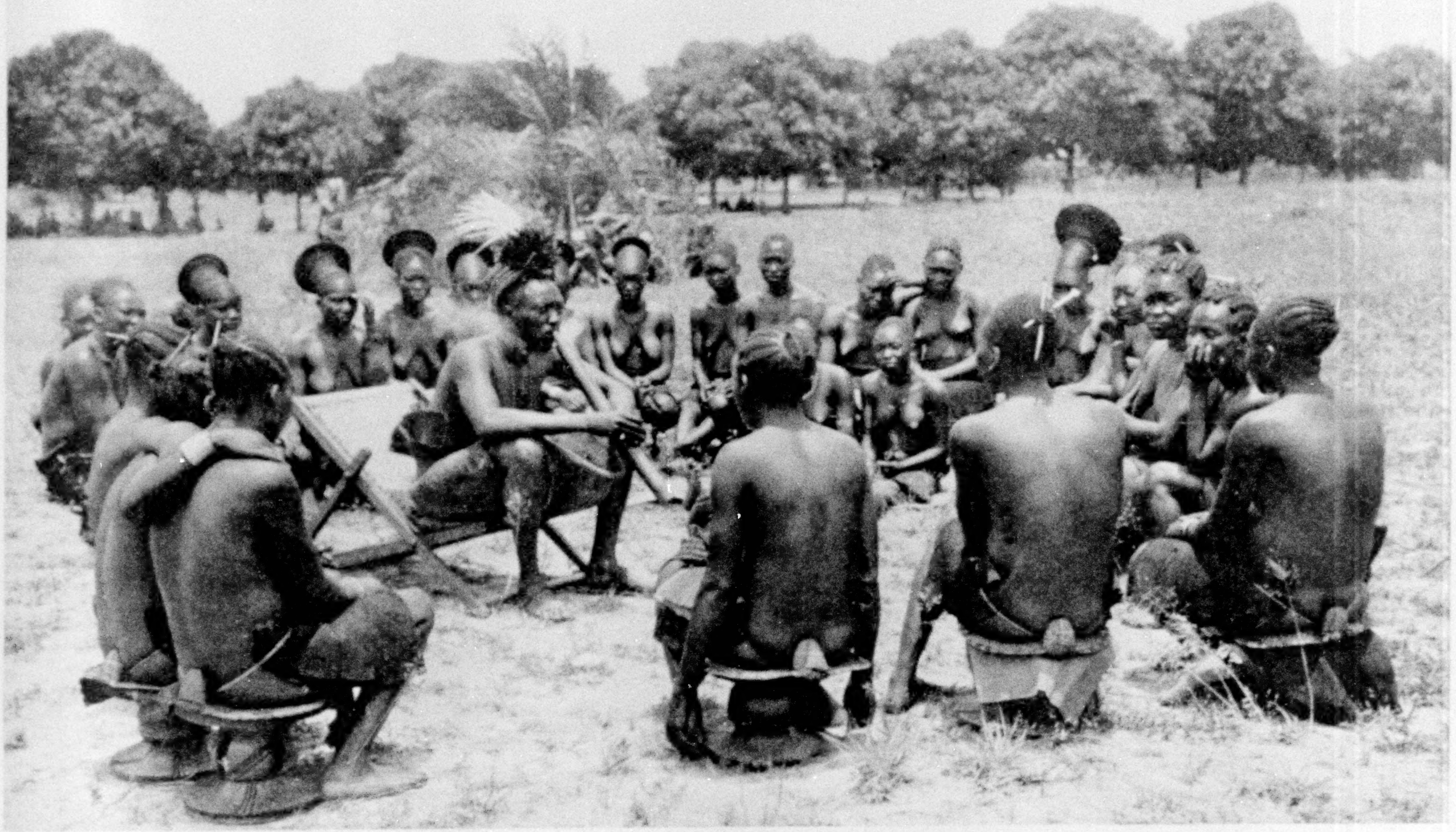


A CRUDE WEIR NEAR STANLEY FALLS PROVIDES AN AMPLE FISH SUPPLY FOR THE NATIVES OF STANLEYVILLE

THE ARTIST OF THE EXPEDITION STUDIES A MANGEBETOU CHILD (SEE, ALSO, PAGE 715)

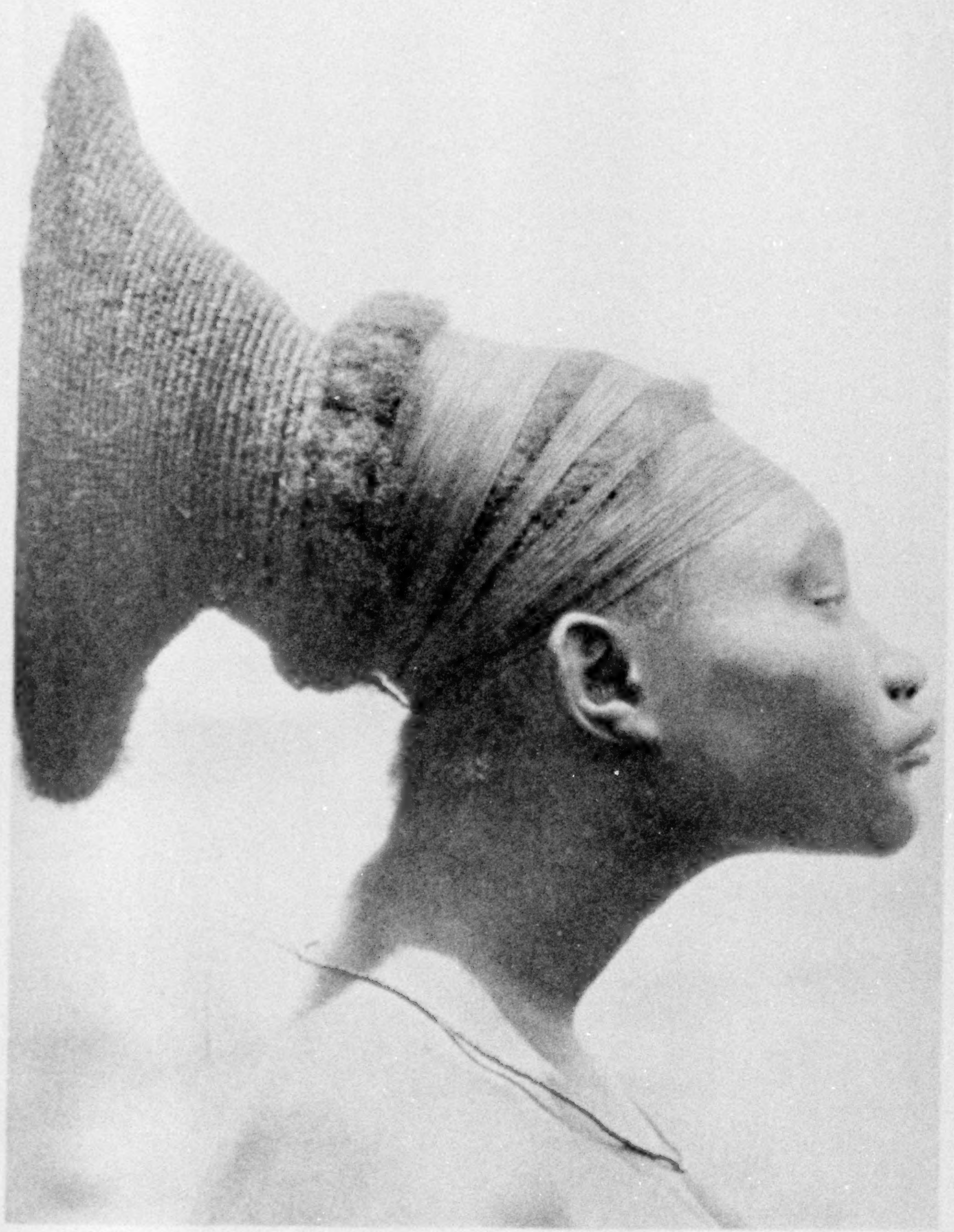


A N'GOGO NATIVE WHOSE BRAIDED HAIR IS A TRIUMPH OF MANY HOURS' LABOR

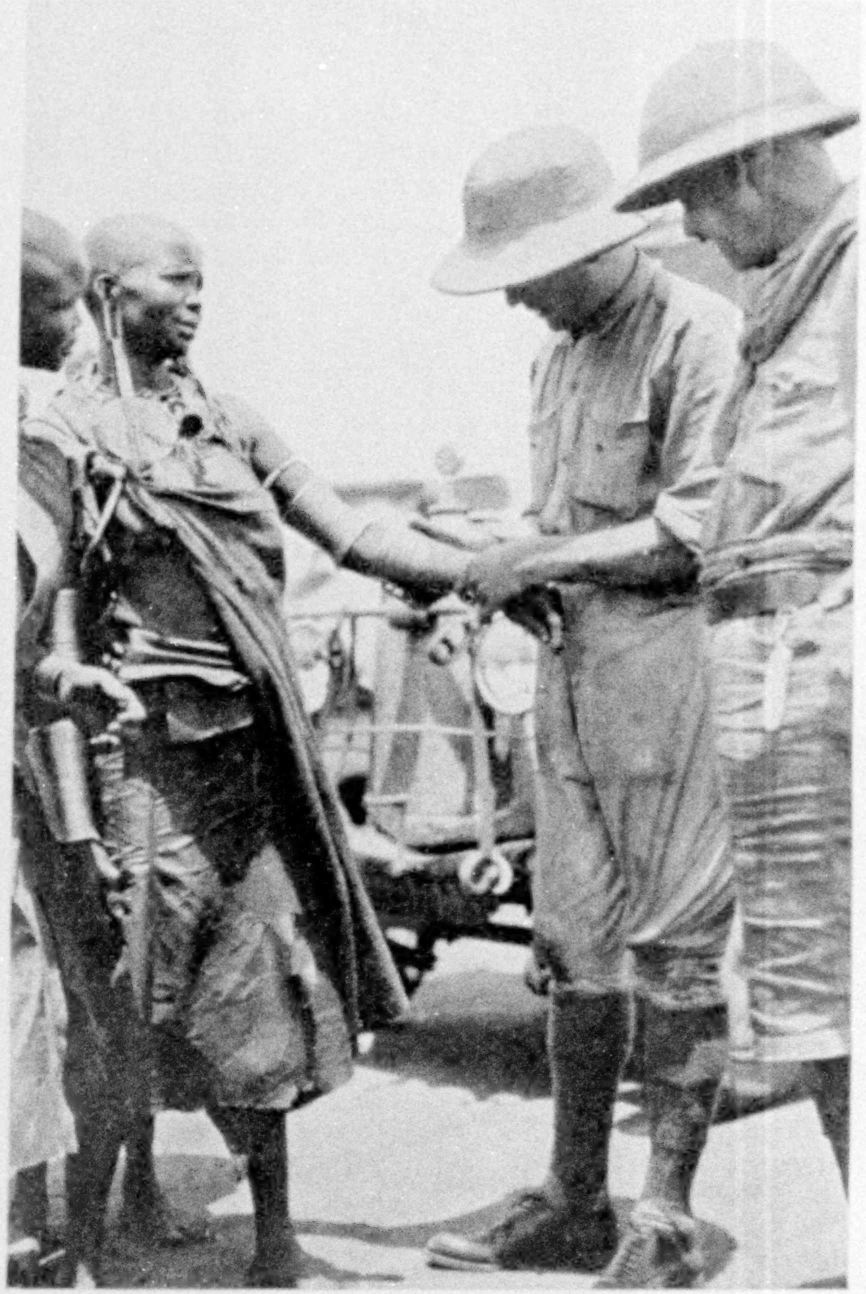


A MANGEBETOU CHIEF, SURROUNDED BY HIS WIVES, ENJOYS HIS PIPE

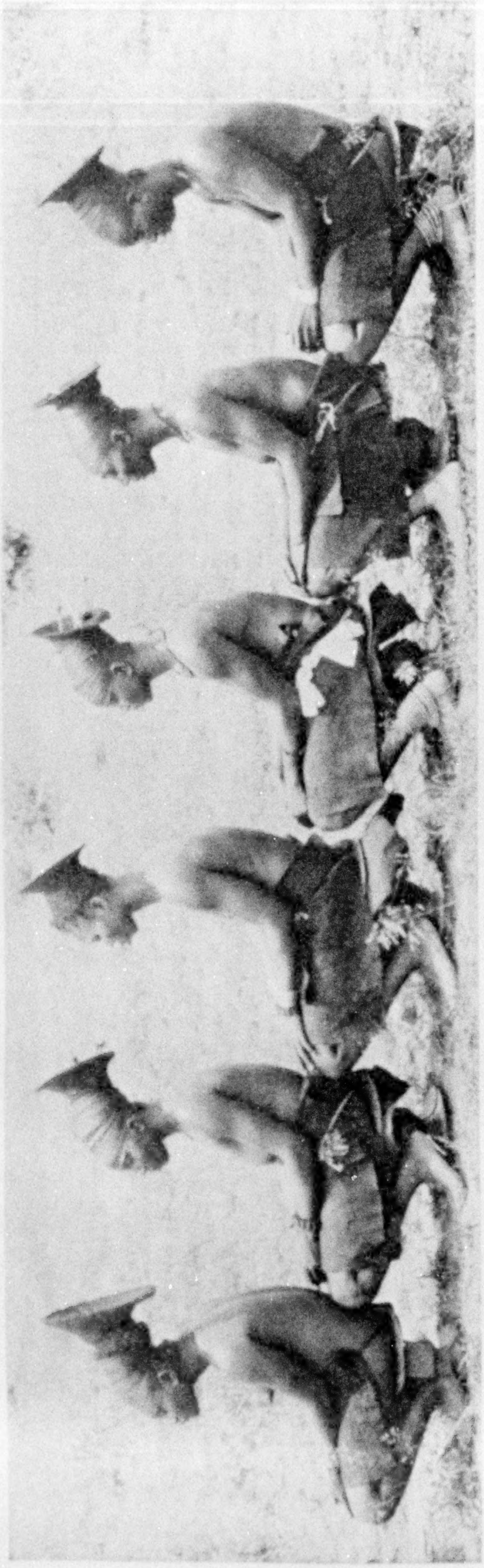
This important tribe occupies a particularly favored region in northeastern Belgian Congo. The men are hunters, leaving all domestic work and cultivation to the household slaves. Women of the upper classes do little or nothing but cook and busy themselves with their toilet. This latter takes up much more time than their scanty attire would indicate (see pages 711, 715, and 716).



THE FAVORITE WIFE OF A MANGEBETOU CHIEF



ADMIRING THE BRACELETS OF A MASAI MATRON: KENYA COLONY



THE "BETTER HALVES" OF A MANGBETOU CHIEF, LINED UP IN ORDER OF PREFERENCE; THE LADY WHO LEADS THE PROCESSION IS ALSO SHOWN IN THE ILLUSTRATION ON PAGE 715

were minute flies, called *kunga*, issuing from larvæ in the water. They take flight, live but a day to reproduce, then fall again into the water.

The natives gather them and make a paste, which, when roasted, is considered a great delicacy.

### DOWN LAKE NYASA AND ON TO MADAGASCAR

Down the length of Lake Nyasa we traveled, and finally, after eight months of struggle through swamps, bush fires, rivers and jungles, a sea breeze brought us the invigorating tang of salt air. Looking through a screen of palms, we saw the blue line of the Indian Ocean at Mozambique.

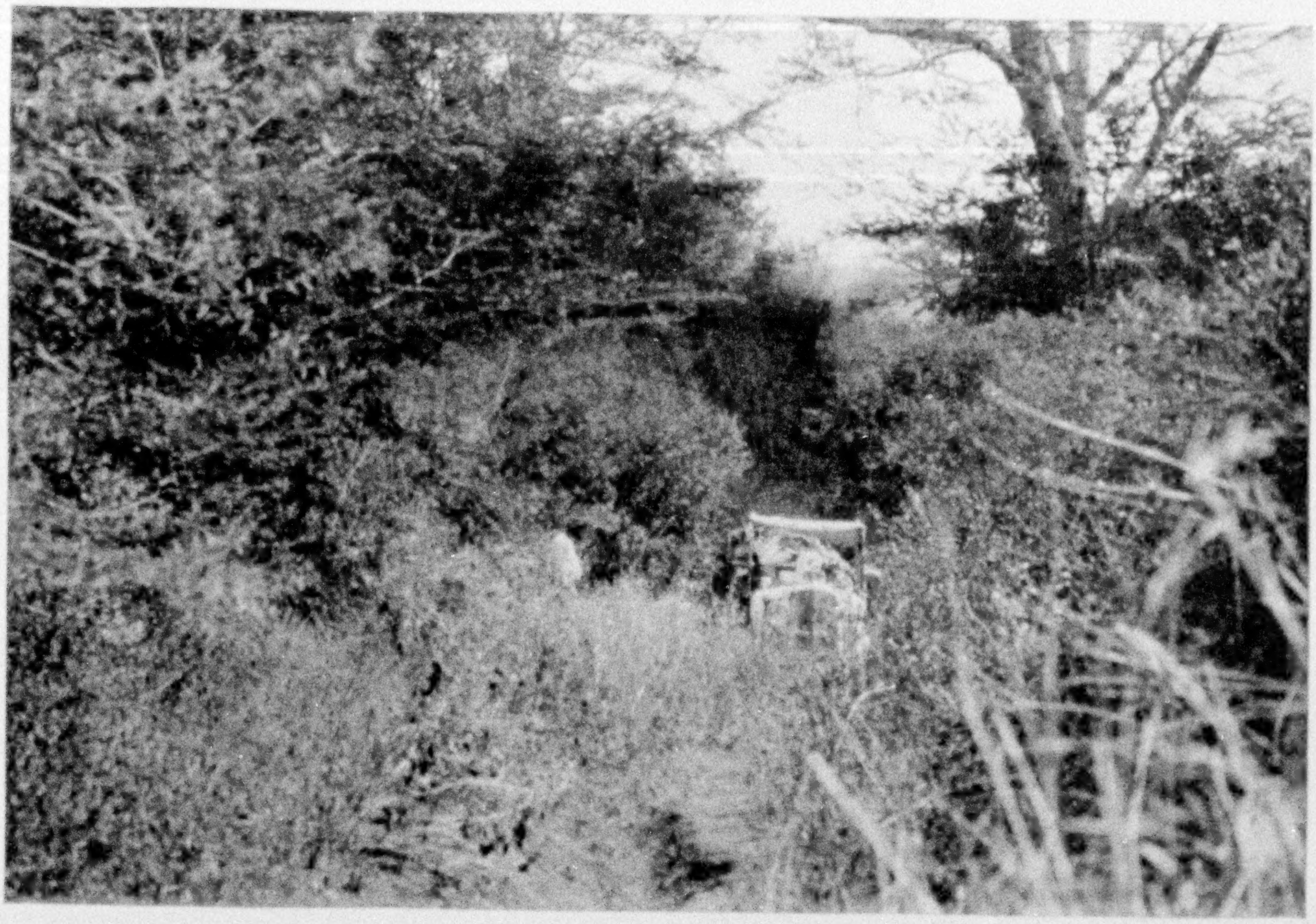
We lingered in this, the chief seaport of Portuguese East Africa, only long enough to take passage for Madagascar. Landing at Majunga, we made our way across the swamps, marshes, bush, and rice plantations that lay between the west coast and Tananarive, the capital, where we were well received by the Governor.

After a short stay we set out for Tamatave, on the east coast, whence we took ship and rounded the north end of the island back to Majunga to meet our comrades, who had come through Mombasa and Dar-es Salaam.

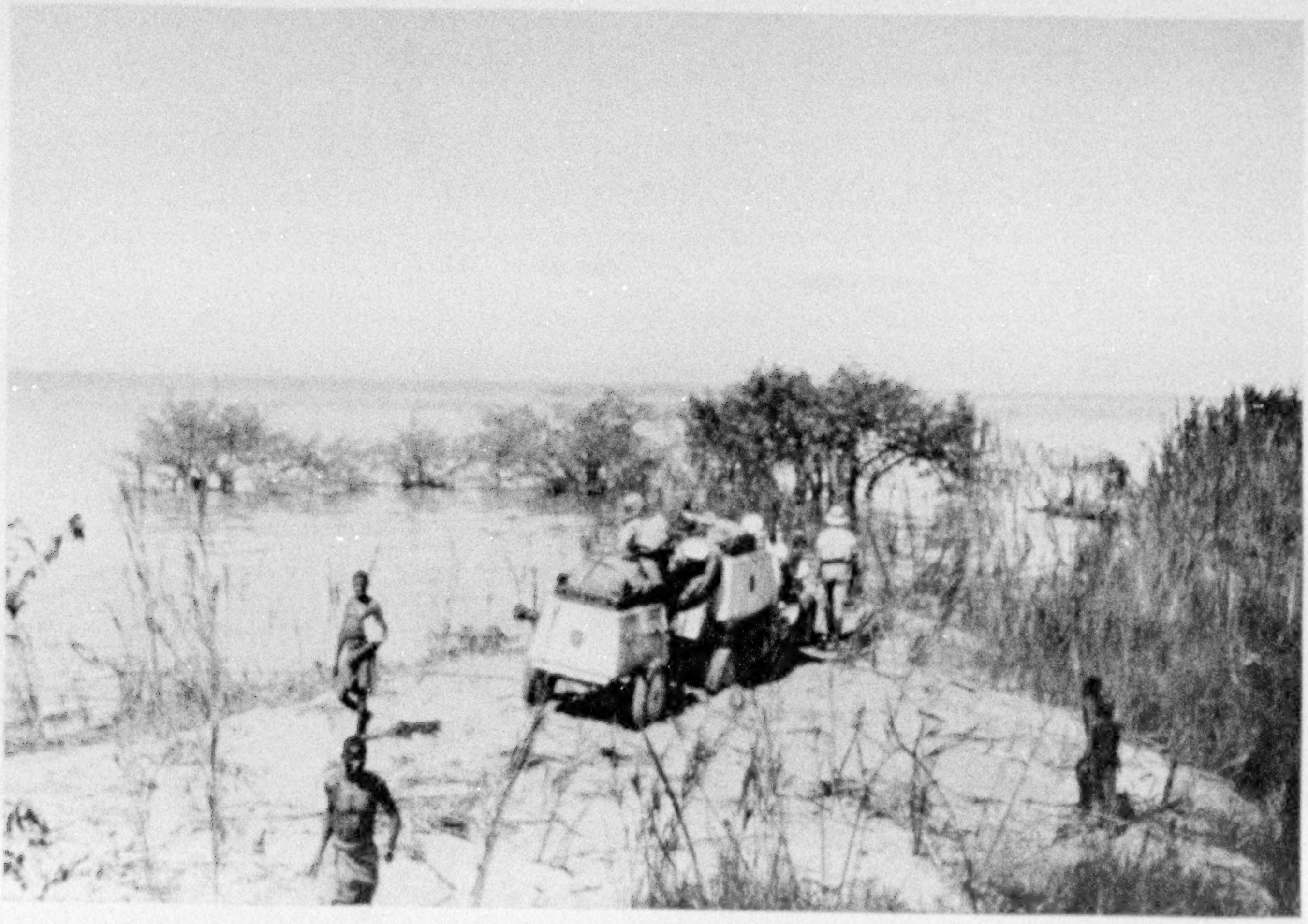
Madagascar is as large as France, Belgium, and Holland combined and has a population of about 3,400,000. It is rich in minerals, timber, and agricultural products and offers a tremendous field for development.

While, with the crossing of the big island our great adventure was nearing an end, the work of our Expedition was in no sense complete. Our task would not be accomplished until we had given to the world a report of our experience.

We had obtained about 90,000 feet of extraordinary motion

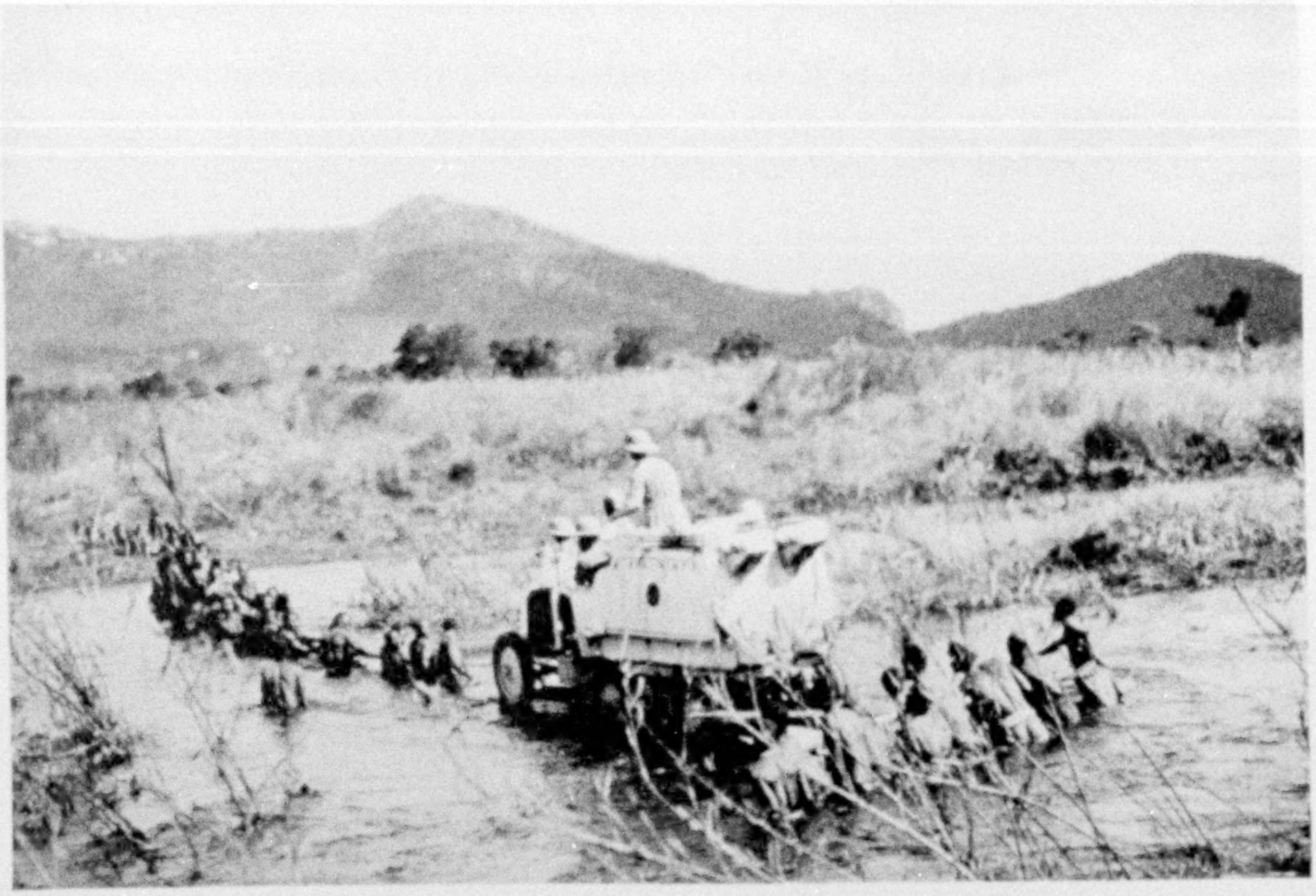


BUCKING THE BUSH: KENYA COLONY

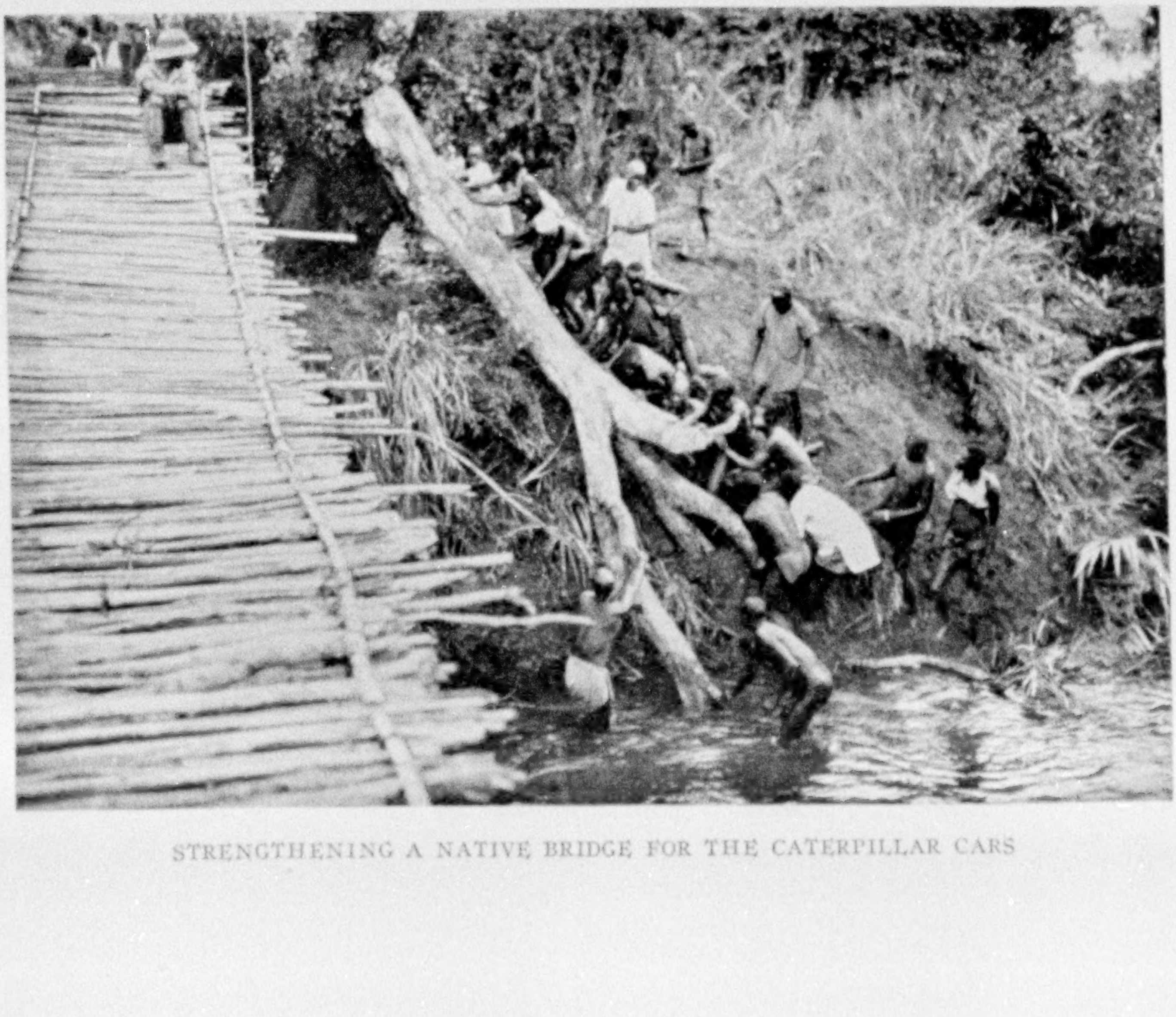


BREAKING TRAIL ALONG LAKE NYASA

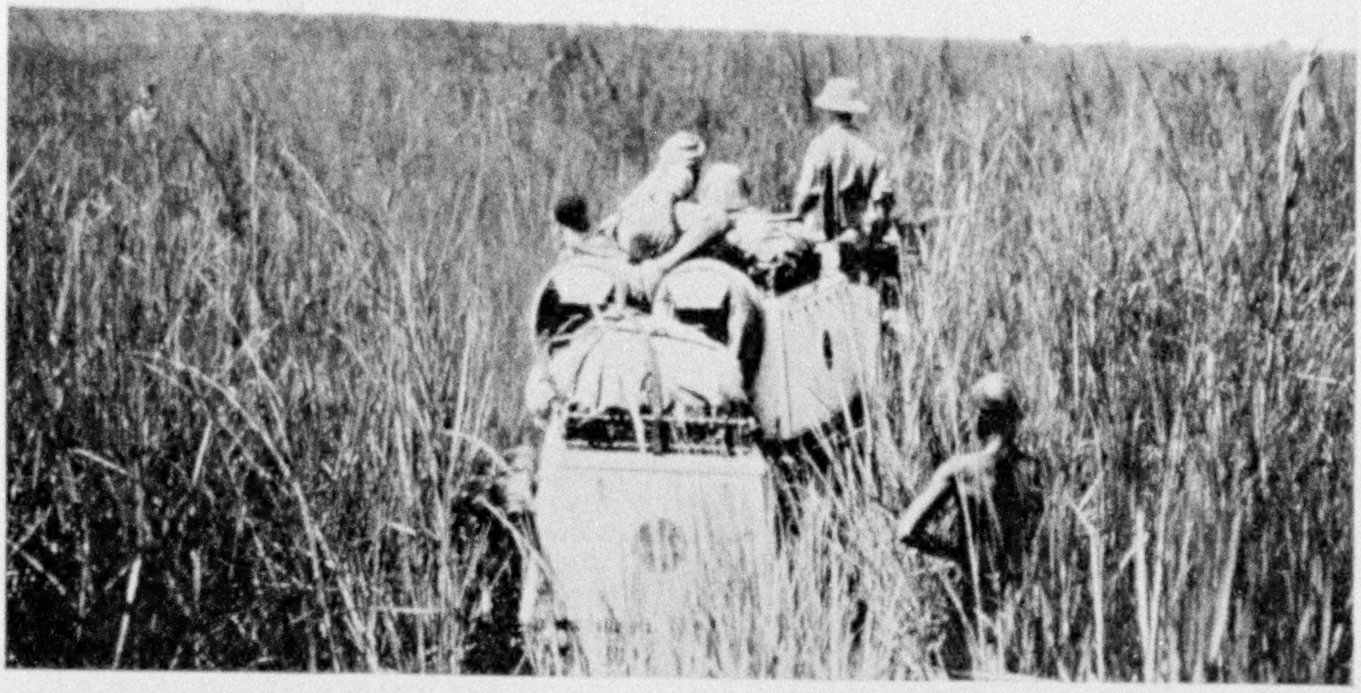
Some of the hardest going of the whole trip was experienced by the author's unit after the Expedition had separated at Tabora and while he was en route to Mozambique, along the shores of Lake Nyasa.



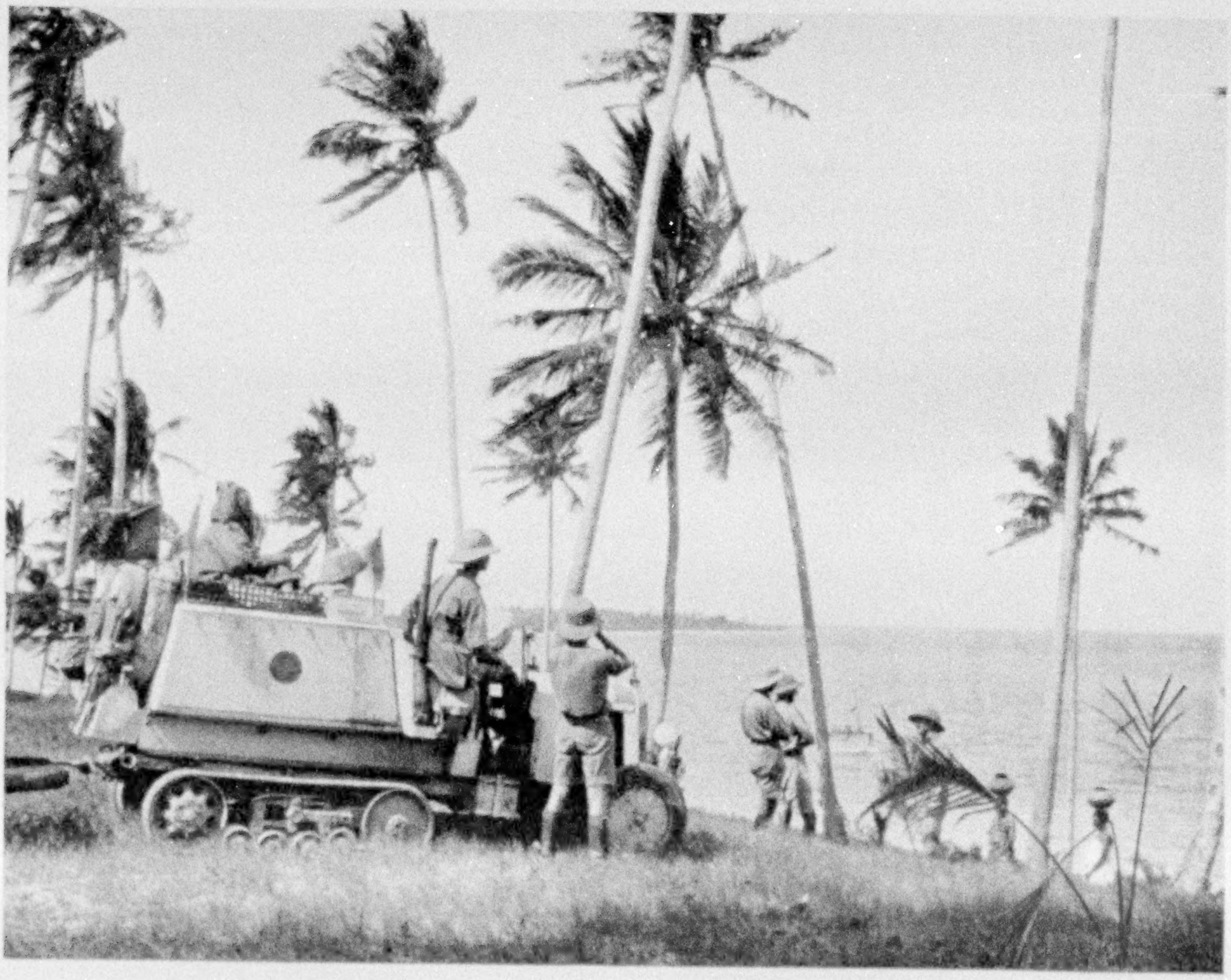
A PRECARIOUS RIVER CROSSING ON A FERRY MADE OF PIROGUES (SEE TEXT, PAGE 707)



STRENGTHENING A NATIVE BRIDGE FOR THE CATERPILLAR CARS



STEERING BY COMPASS IN THE TALL GRASS OF EAST AFRICA



ARRIVING ON THE SHORES OF THE INDIAN OCEAN: LUMBO, NEAR MOZAMBIQUE

PARADING THE STREETS OF MAJUNGA, MADAGASCAR

From this, the principal seaport on the west coast of Madagascar, the author led his party successfully across the great island to Tananarive, the capital and journey's end.

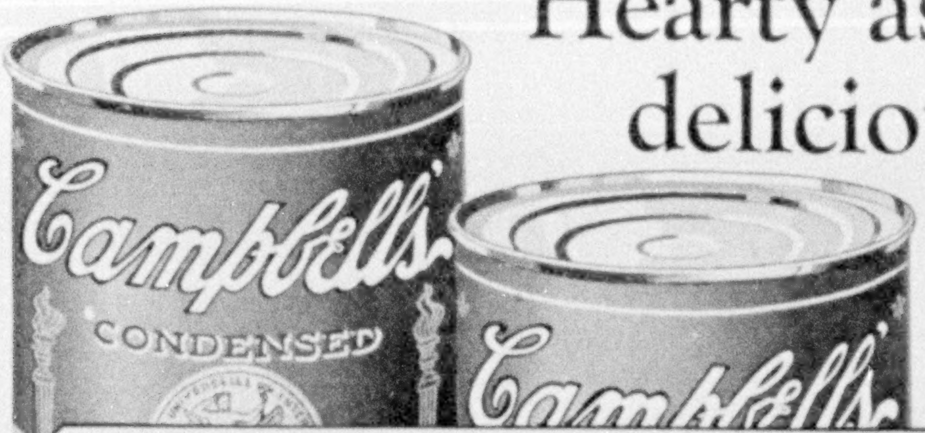
pictures and more than 8,000 photographs while crossing Africa. These, together with M. Jacovleff's many sketches, must be exhibited and an account written of our adventures and observations.

But, despite the magnitude of the work remaining, as we boarded a ship to take us up the Indian Ocean and through the Mediterranean Sea back to France, ours was the satisfaction that comes to pioneers, and we thought with pride and pleasure of the achievements of our nine-month motor trip through wilds which never before had been so traveled.

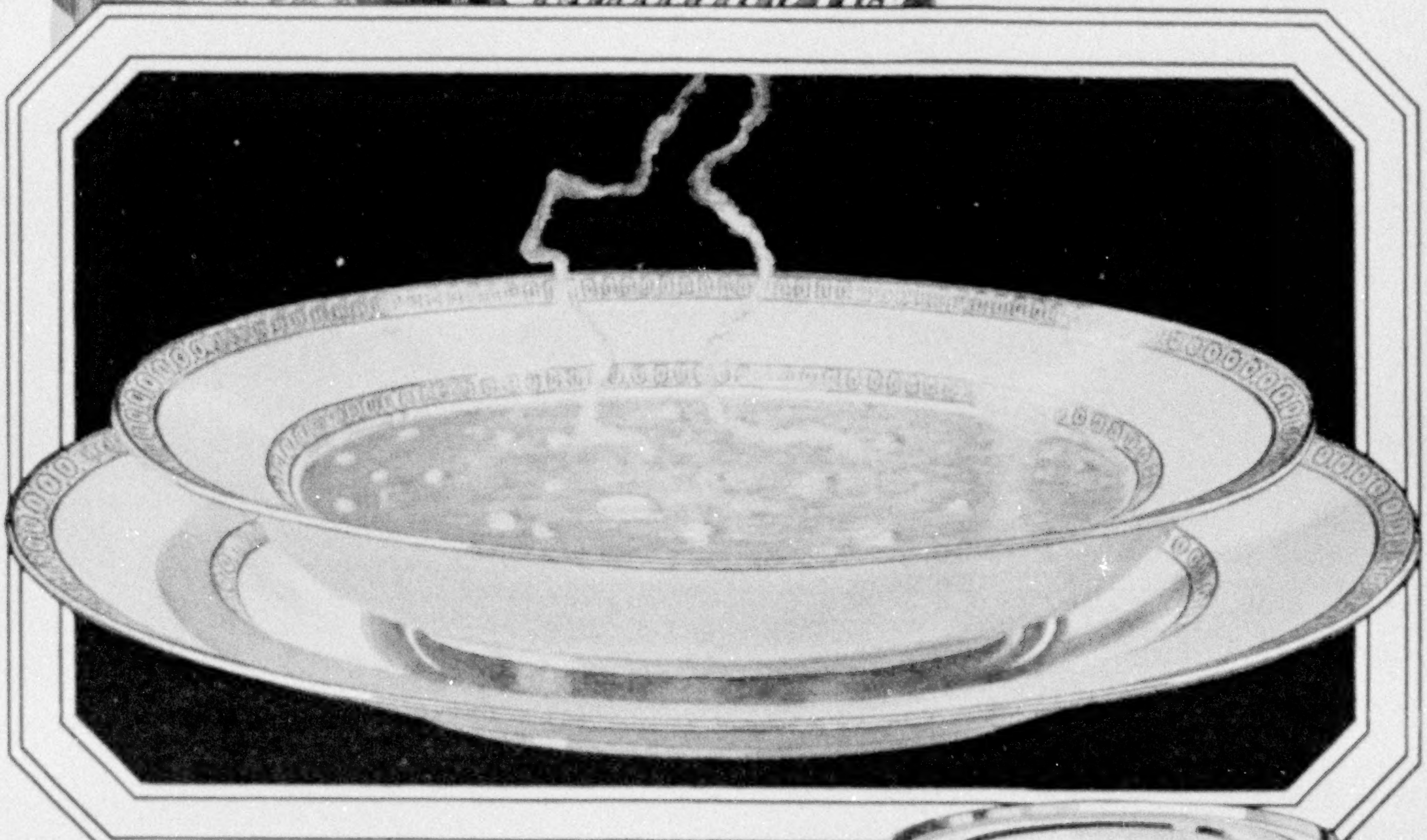
*Notice of change of address of your* GEOGRAPHIC MAGAZINE *should be received in the office of the National Geographic Society by the first of the month to affect the following month's issue. For instance, if you desire the address changed for your August number, the Society should be notified of your new address not later than July first.*

# VEGETABLE SOUP!

## Hearty as it is delicious!


Campbell's
CONDENSED
Campbell's

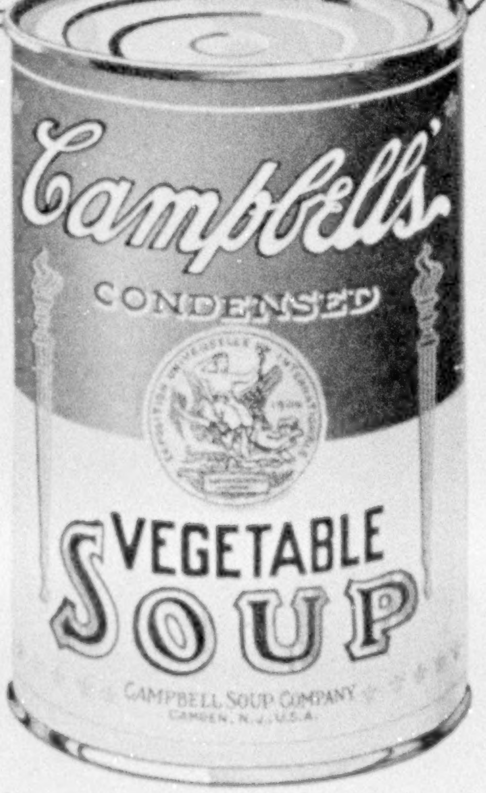
32 ingredients



"I long ago gave up making vegetable soup in my kitchen," said a housewife. "Life's too short to go to all that trouble when I can get such good vegetable soup at the store!"

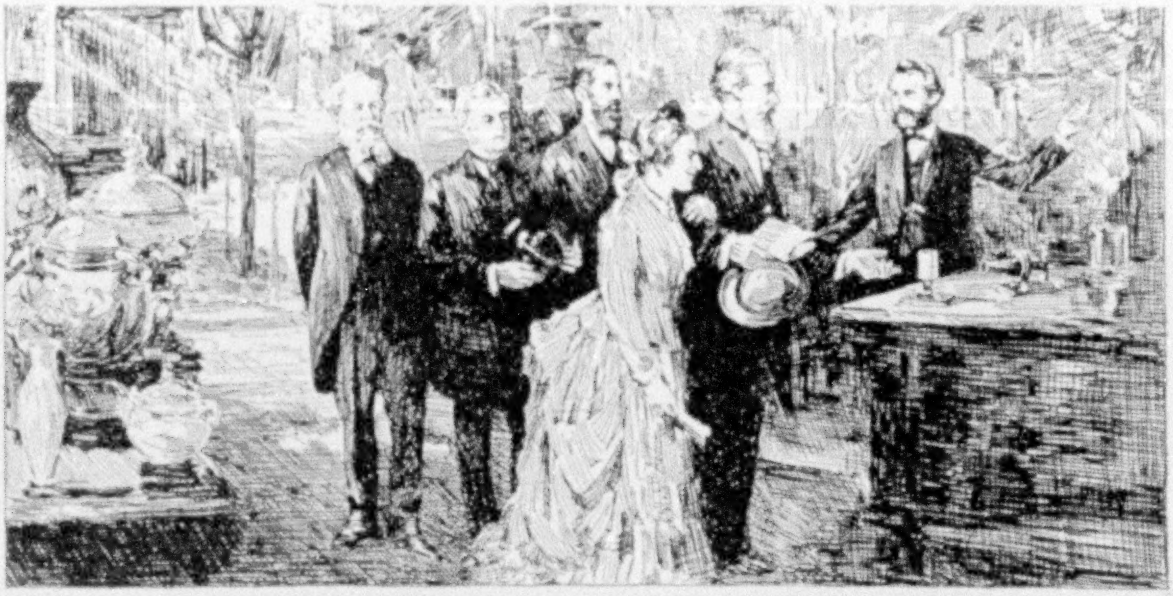
Women are so quick to appreciate splendid quality in food, combined with ease and convenience of service!

How much it saves them to be able any time, anywhere simply to say to their grocer "Campbell's Vegetable Soup!" And get for their table a soup with fifteen different vegetables, invigorating beef broth, substantial cereals, herbs and seasoning!


Campbell's
CONDENSED
VEGETABLE
SOUP
CAMPBELL SOUP COMPANY
CAMDEN, N.J. U.S.A.

12 cents a can

LOOK FOR THE RED-AND-WHITE LABEL



# *The Telephone at the Centennial*

One hundred years after the signing of the Declaration of Independence, the infant telephone was first exhibited at the Philadelphia Exposition.

Since the dawn of civilization, mankind had sought means of communicating over distances which unaided human speech could not bridge. Drums, signal fires, swift runners, the pony express, and finally the electric telegraph were means to get the message through. It remained for the telephone to convey a speaker's words and tones over thousands of miles.

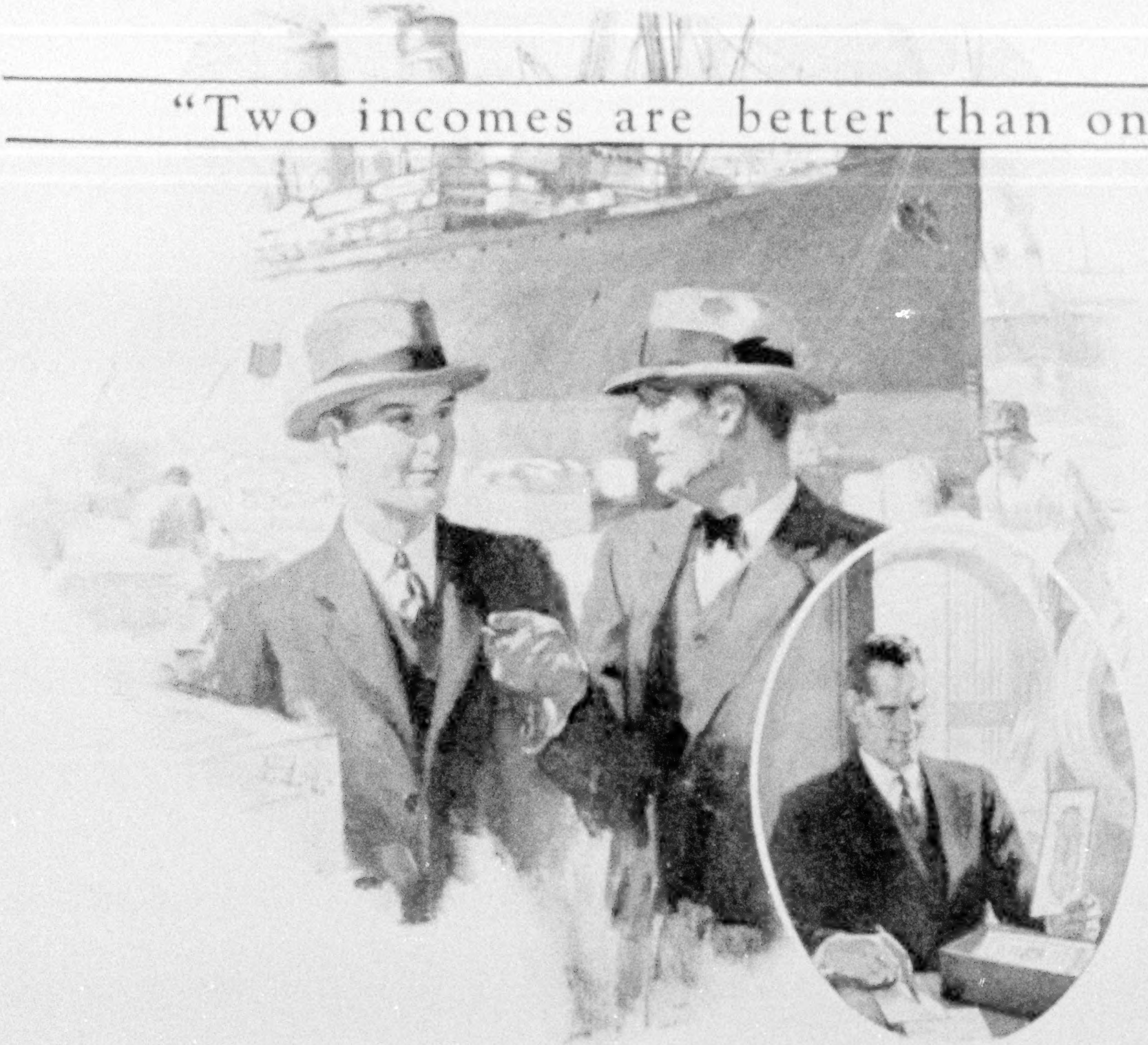
"My God, it talks!" exclaimed the Emperor of Brazil before a group of scientists at the Philadelphia Exposition, as he heard and understood the voice of Alexander Graham Bell, demonstrating the new invention.

Today, after a brief half-century, the telephone lines of the Bell System have become the nerves of the nation. The telephone connects citizen with citizen, city with city, state with state for the peace and prosperity of all.

American Telephone and Telegraph Company
and Associated Companies

*BELL SYSTEM*

IN ITS SEMI-CENTENNIAL YEAR THE BELL SYSTEM LOOKS FORWARD TO CONTINUED PROGRESS IN TELEPHONE COMMUNICATION



"Two incomes are better than one"

# When ships come in

No matter from what source your own personal earnings are derived—whether from a business, a profession or a salary—an additional income from good bonds, built up by investing regularly a part of current earnings, will prove an effective anchor to windward—a protection against emergencies.

It is our business to select and offer desirable bond investments for your surplus funds. We maintain offices in more than fifty leading cities of the country at which investment advisers are always available for counsel.

The National City Company

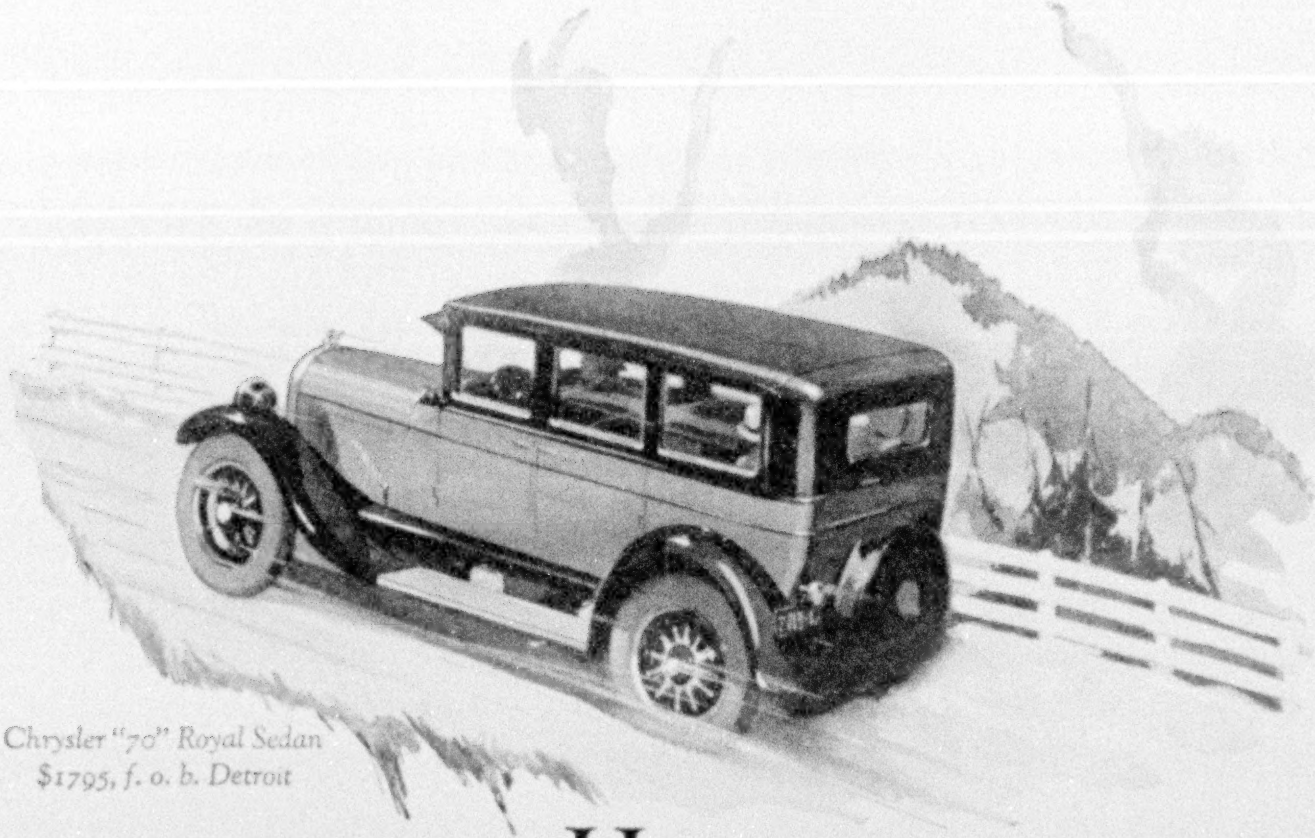
*National City Bank Building, New York*

BONDS · ACCEPTANCES · SHORT TERM NOTES

*Let Kodak keep your vacation*

*Autographic Kodaks, $5 up*

Eastman Kodak Company, Rochester, N. Y., *The Kodak City*



*Chrysler "70" Royal Sedan*
*$1795, f. o. b. Detroit*

# *How*
# Chrysler Sweeps All Comparison Aside

Chrysler "70" came into a seemingly crowded motor car market some two years ago, and swept its way into unprecedented acceptance as a long-lived quality product. That which ordinarily takes years to achieve was won almost overnight.

Chrysler engineers approached the question of motor dimensions, power, acceleration, long life and riding ease, free to devise the ideally best and then provide the means to produce the finished product.

They brought to bear both scientific exactness and artistry—embodying in the new Chrysler elements of dynamic symmetry and elegance no one else has ever attained.

That is why Chrysler took the country by storm at the outset—why it still stands and will long stand alone—why if you want what the Chrysler gives, the Chrysler alone can satisfy you.

CHRYSLER SALES CORPORATION
DETROIT, MICHIGAN
CHRYSLER CORPORATION OF CANADA, LIMITED
WINDSOR, ONTARIO

*Chrysler Model Numbers Mean Miles Per Hour*

CHRYSLER "70"—*Phaeton,* $1395; *Coach,* $1395; *Roadster* $1525; *Sedan,* $1545; *Royal Coupe,* $1695; *Brougham,* $1745. *Royal Sedan,* $1795; *Crown Sedan,* $1895. *Disc wheels optional. All prices f. o. b. Detroit, subject to current Federal excise tax. All models equipped with full balloon tires.*

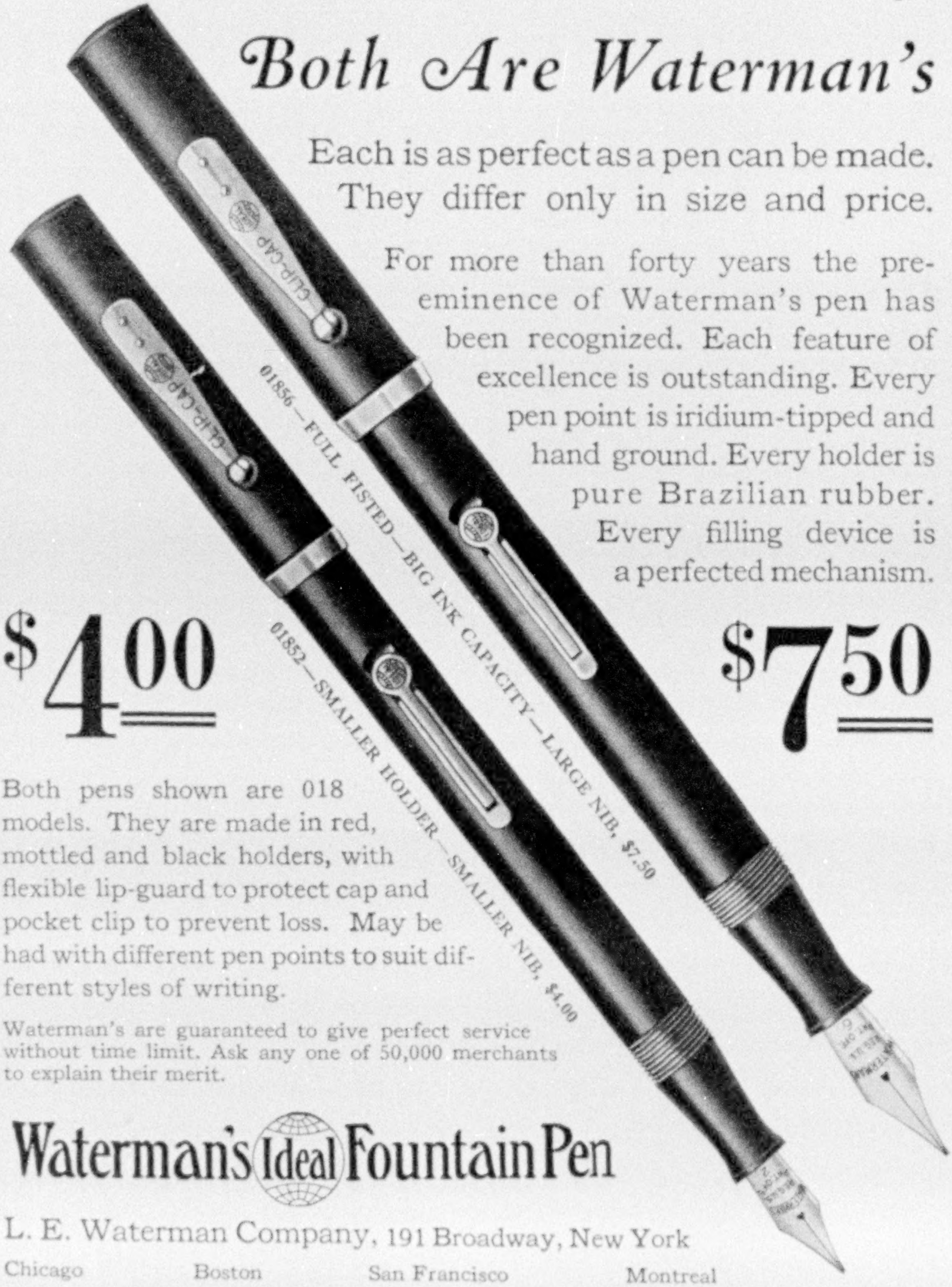
Ask about Chrysler's attractive time-payment plan. More than 4300 Chrysler dealers assure superior Chrysler service everywhere.

All Chrysler models are protected against theft by the Fedco patented car numbering system, pioneered by and exclusive with Chrysler, which cannot be counterfeited and cannot be altered or removed without conclusive evidence of tampering.

**CHRYSLER**
**"70"**

# One of These Two Pens Will Suit You Perfectly

*Both Are Waterman's*



CLIP-CAP
CLIP-CAP
01856—FULL FISTED—BIG INK CAPACITY—LARGE NIB, $7.50
01852—SMALLER HOLDER—SMALLER NIB, $4.00

Each is as perfect as a pen can be made. They differ only in size and price.

For more than forty years the preeminence of Waterman's pen has been recognized. Each feature of excellence is outstanding. Every pen point is iridium-tipped and hand ground. Every holder is pure Brazilian rubber. Every filling device is a perfected mechanism.

**$4.00**

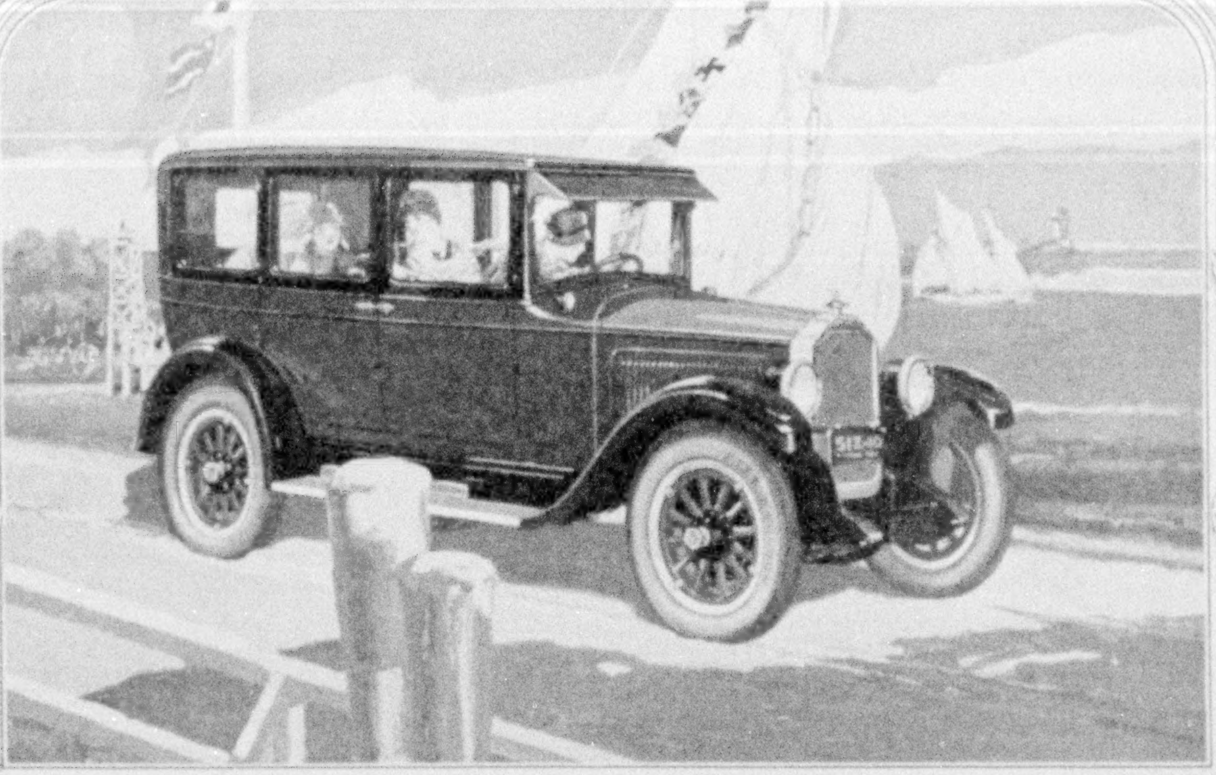
**$7.50**

Both pens shown are 018 models. They are made in red, mottled and black holders, with flexible lip-guard to protect cap and pocket clip to prevent loss. May be had with different pen points to suit different styles of writing.

Waterman's are guaranteed to give perfect service without time limit. Ask any one of 50,000 merchants to explain their merit.

**Waterman's Ideal Fountain Pen**

L. E. Waterman Company, 191 Broadway, New York
Chicago Boston San Francisco Montreal



# *Women welcome it with open arms!*

America's liveliest and most astonishing car . . . The easiest to steer, and start, and park and handle . . . A car whose super-efficiency excels anything that ever was built of its size or type or class! . . .

An ideal car for the exacting woman-driver, no new creation ever presented to the motoring public of this country has so quickly and completely captured the national imagination as the new "70" Willys-Knight Six!

In the Knight type sleeve-valve engine of the new "70" Willys-Knight Six, the principle of high-speed engine construction has been utilized with results that are absolutely astounding.

With $2\frac{15}{16}$-inch bore and a $4\frac{3}{8}$-inch stroke, the power-plant of this car delivers greater power per cubic inch of piston displacement, throughout its entire range, than any stock American motor-car engine built today!

The steering facility of this new car will amaze you. Eight Timken roller bearings cradle the steering mechanism with the utmost absence of friction, affording an ease of control that a child may master without apparent effort. . . .

Don't fail to investigate this new leader among smart Sixes at your earliest opportunity . . . The new Willys Finance Plan means a smaller down payment, smaller monthly payments; and the lowest credit-cost in the industry.

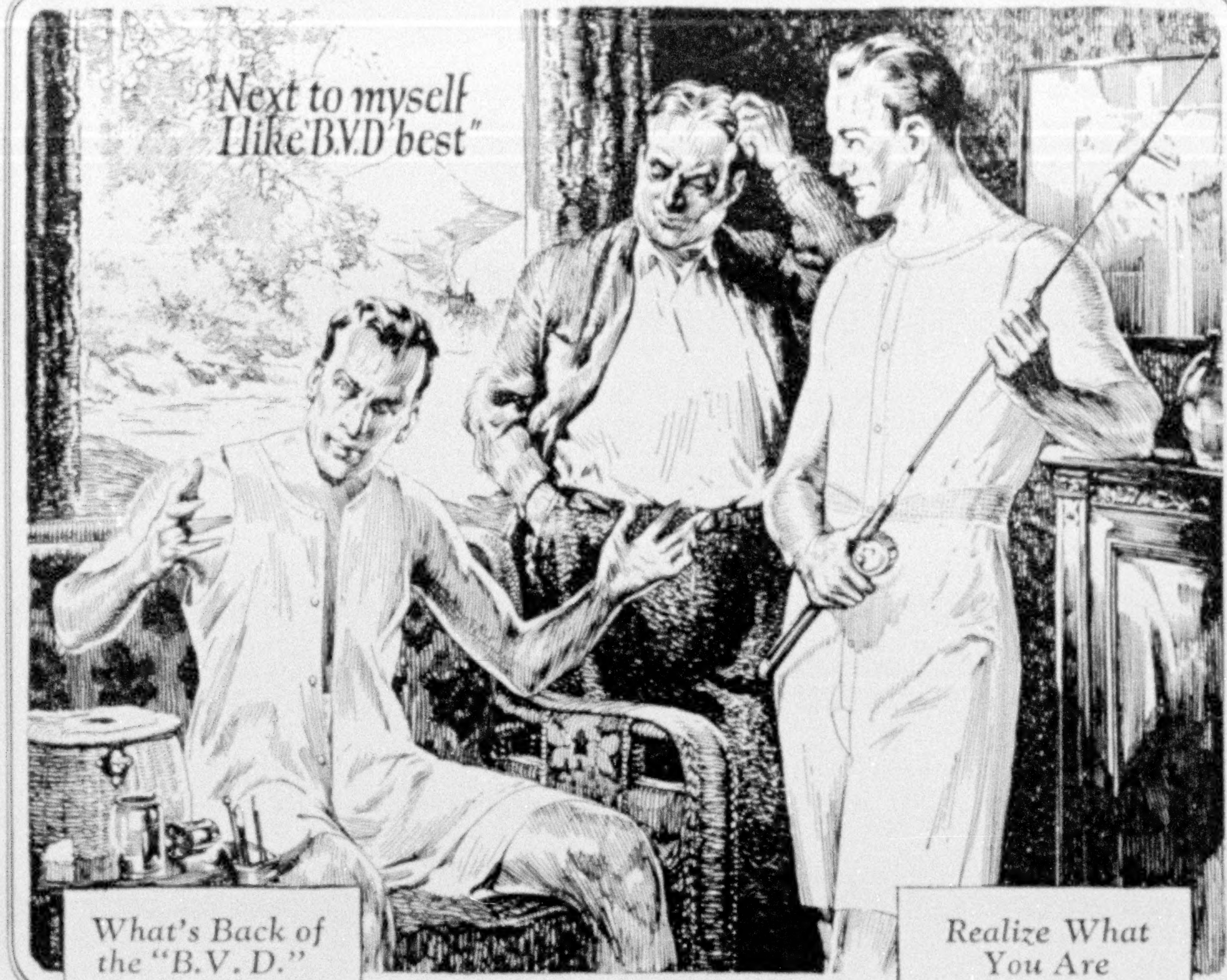
Touring $1295, Sedan $1495, f. o. b. Factory. We reserve the right to change prices and specifications without notice.

Willys-Overland, Inc., Toledo, Ohio
Willys-Overland Sales Company Ltd., Toronto, Can.

*The* NEW
"70" WILLYS-KNIGHT 6

CDE

*Now — in the Great* WILLYS-OVERLAND LINE *— a Car for Every Purse*


"Next to myself I like B.V.D. best"

### What's Back of the "B.V.D." Label?

From its specially treated nainsook, woven in our own mills, to the last detail of its scientific construction, "B.V.D." is an underwear *with differences that count.* Its quality is as unique as the fame of its trademark.

HIS fish story may not "wear," but his underwear surely *will!* Matchless *economy*—plus better fit and cooler comfort—has given "B.V.D." world-leading popularity!

### Realize What You Are Buying!

It pays really to *understand* underwear, if you want your money's *most.* Write for our interesting free booklet *"Why the Knowing Millions Say: 'Next to Myself I Like 'B. V. D.' Best!'"* It tells just how "B.V.D." is made and is a revelation in the fine points of fine underwear.

Be sure to SEE it's "B. V. D"

*It ALWAYS Bears this Red-Woven Label*

MADE FOR THE
**B.V.D.**
BEST RETAIL TRADE

Trade Mark Reg. U.S. Pat. Off. and Foreign Countries

"B.V.D."
Union Suit
*(Patented Features)*
Men's $1.50
the suit
Youths' 85c

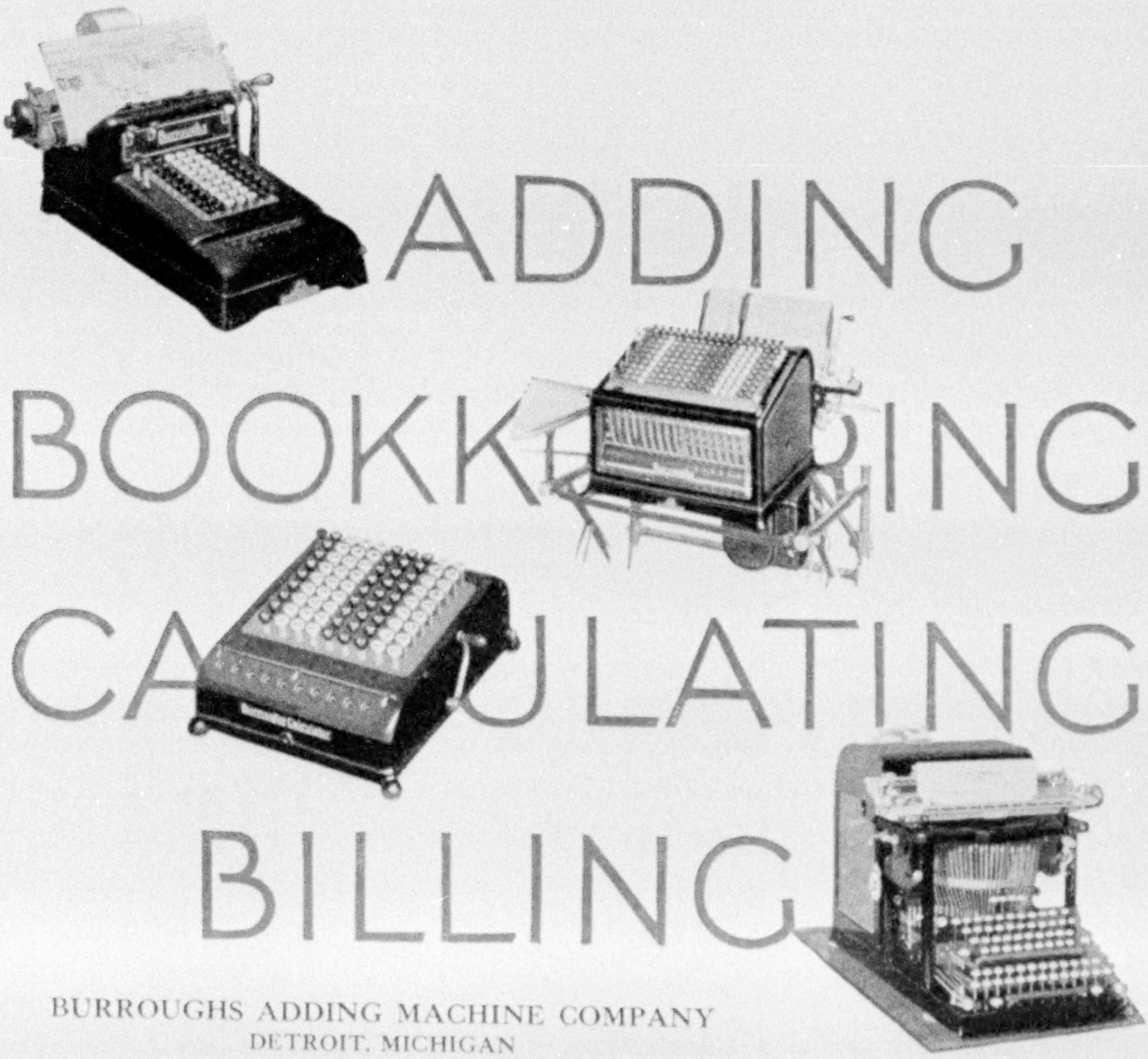
"B.V.D."
Shirts
and Drawers
85c
the garment

The B. V. D. Company, Inc., New York
*Sole Makers of "B. V. D." Underwear*

© 1926 The B. V. D. Co., Inc.

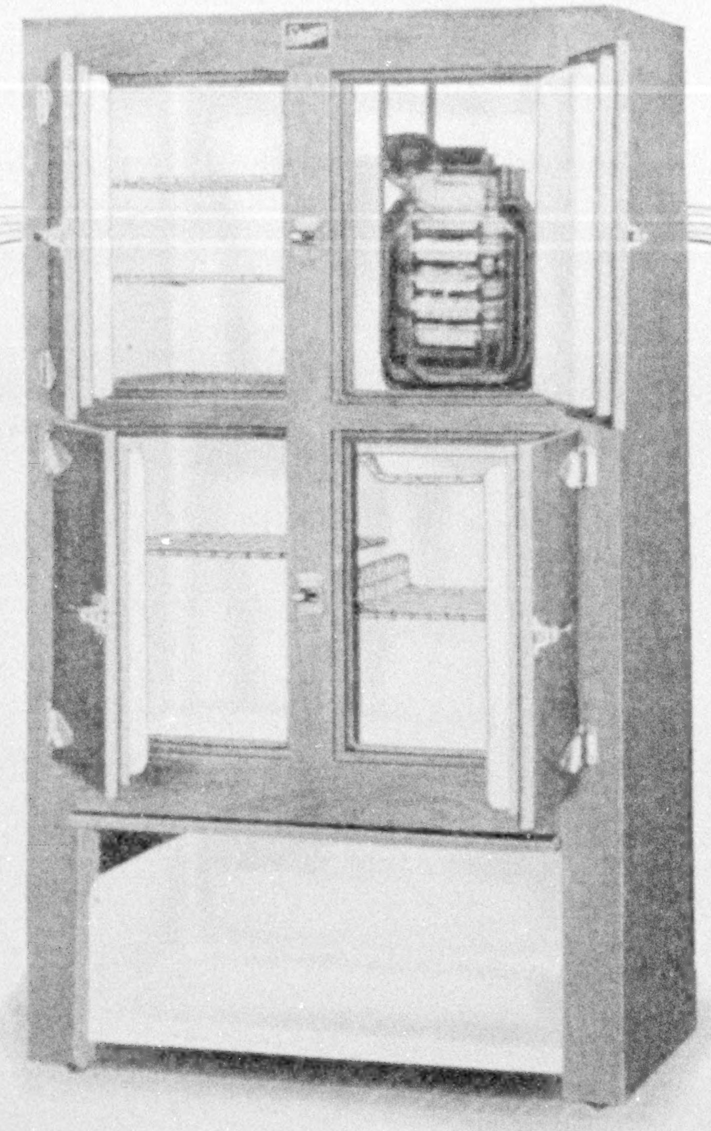
# Burroughs

## MACHINES FOR THE FOUR FUNDAMENTAL BUSINESS PROBLEMS


ADDING
BOOKKEEPING
CALCULATING
BILLING

BURROUGHS ADDING MACHINE COMPANY
DETROIT, MICHIGAN

**ADDING · BOOKKEEPING · CALCULATING AND BILLING MACHINES**



Seeger

ANNOUNCES A NEW LINE OF REFRIGERATORS BUILT EXCLUSIVELY FOR ELECTRICAL REFRIGERATION.

There are many features wherein this new type of refrigerator differs from any others so far produced.

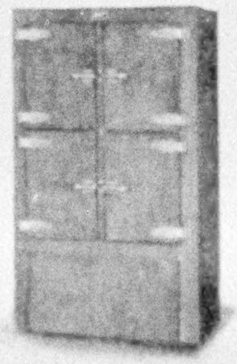
In the refrigerating chamber above is shown a composite photograph of eight different cooling units of the principal electrical refrigeration manufacturers.

THE REFRIGERATOR IS WORTHY OF THEM—THEY ARE WORTHY OF IT.

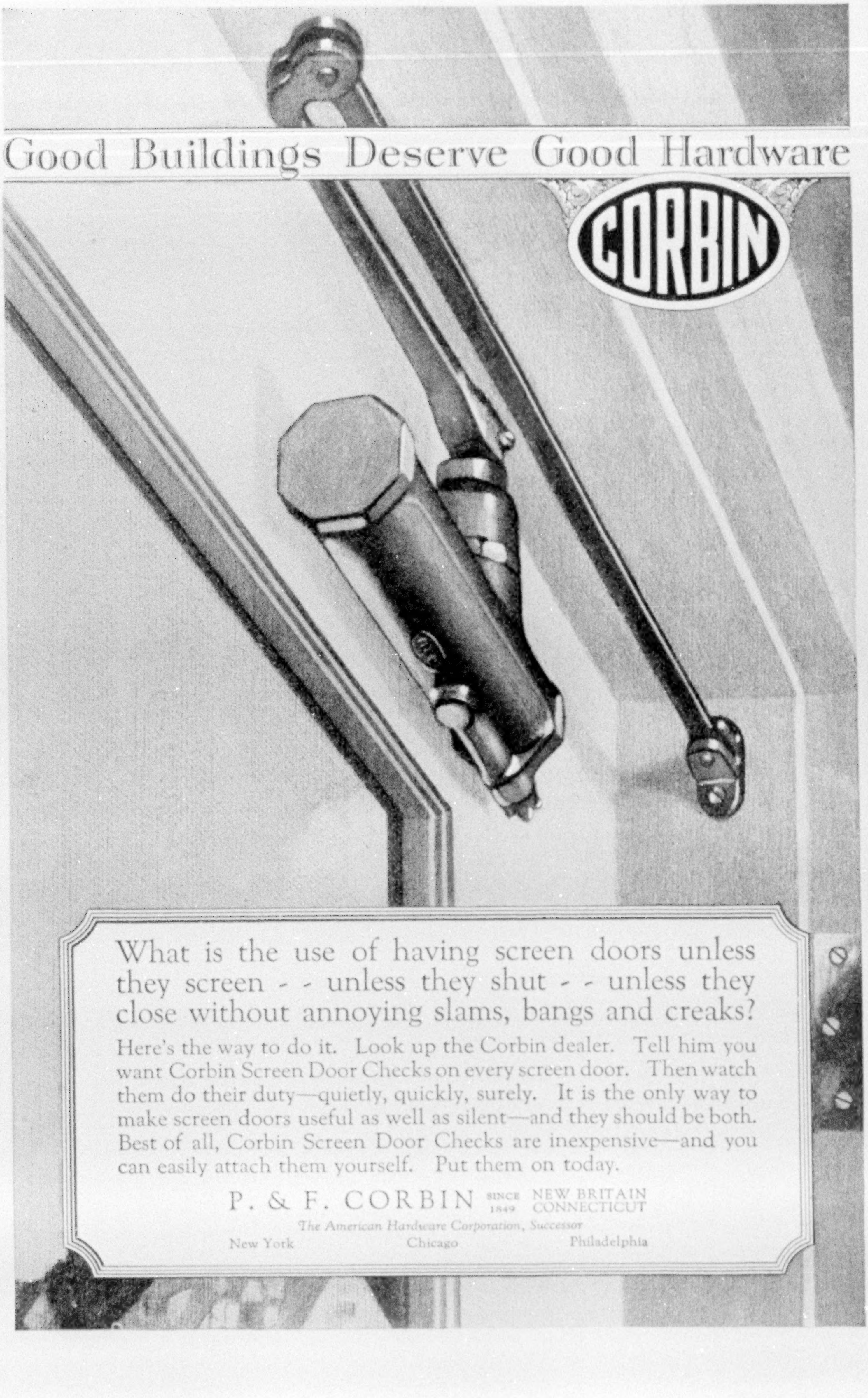
The Representatives of Electrical Refrigeration will
be pleased to show and demonstrate the new Seeger.

SEEGER REFRIGERATOR COMPANY
Saint Paul—New York—Boston—Chicago—Los Angeles—Atlanta

Seeger
REFRIGERATOR



*Standard of the American Home*



# Good Buildings Deserve Good Hardware

What is the use of having screen doors unless they screen - - unless they shut - - unless they close without annoying slams, bangs and creaks?

Here's the way to do it. Look up the Corbin dealer. Tell him you want Corbin Screen Door Checks on every screen door. Then watch them do their duty—quietly, quickly, surely. It is the only way to make screen doors useful as well as silent—and they should be both. Best of all, Corbin Screen Door Checks are inexpensive—and you can easily attach them yourself. Put them on today.

P. & F. CORBIN SINCE 1849 NEW BRITAIN CONNECTICUT
*The American Hardware Corporation, Successor*
New York Chicago Philadelphia

## Up-to-the-minute People are now taking their own MOTION PICTURES

with *Filmo*

REGISTERED

IF you are one who cares about matters of personal distinction you will be interested in *Filmo*, the Motion Picture Camera used by Vice-President Dawes, J. Pierpont Morgan, J. Ogden Armour, Galli-Curci, H. R. H. The Prince of Wales, Zane Grey, John T. McCutcheon and hundreds of equal prominence the world over. *Filmo* has popularized the sport of taking *personal motion pictures*—instead of old-time snapshots.

This compact, easy to carry camera requires no tripod, no cranking, no focusing for distance. Simply sight it from the eye as you would a spy-glass. The picture is seen in the finder just as you want to take it—right side up and straight before you. The spy-glass viewfinder is a distinctive feature, originated and used exclusively by this company. Touch a button and motion pictures of what you see are taken automatically. Pictures you get are shown on a wall or screen in your home or club with the *Filmo* automatic Projector, as clearly as the movies you see at the best theatres.

*Filmo* has been perfected for your personal use by the world's largest manufacturers of motion picture cameras and equipment. The *Filmo* Camera brings you the precision of our professional cameras costing up to $5000. Yet its cost is but $180—less than you probably paid for the phonograph or radio now in your home. *Filmo* is a really fine quality product, unique in design, perfect in construction and beautiful in appearance—an instrument you will be proud to own.

*Ask the dealer in highest quality merchandise in your city to show you how personal movies are made with Filmo. Write us for descriptive booklet, "What You See, You Get," telling the whole interesting Filmo story*

**BELL & HOWELL CO.**
1817 Larchmont Ave., CHICAGO
*New York, Hollywood and London*

Manufacturers of 95% of the Professional Cameras and Equipment in Use the World Over
*Established 1907*

# BOURNEMOUTH

### *England's Garden City by the Sea*

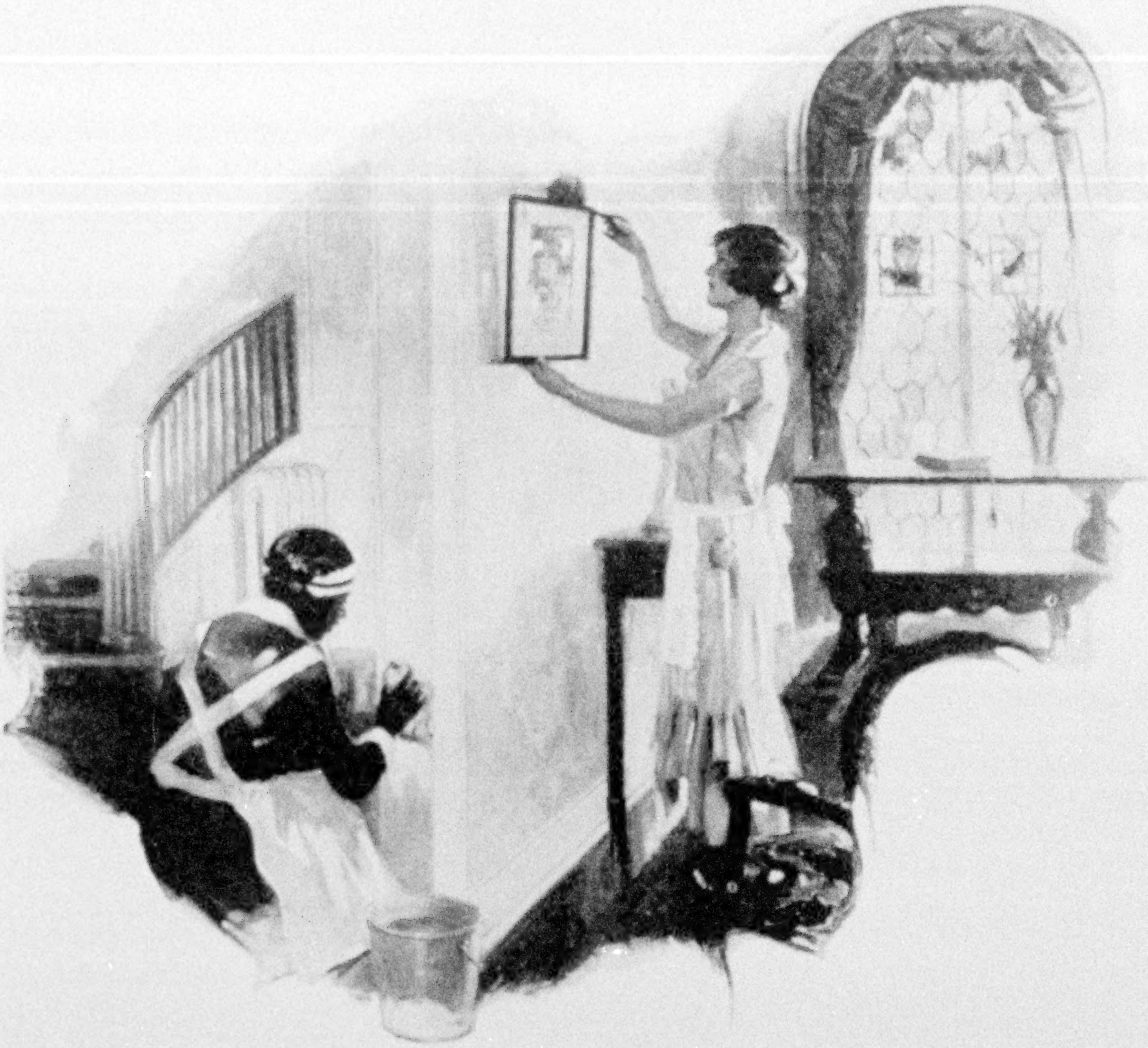
AN hour's journey, by train, from Southampton, or just over two hours' from London, brings one to beautiful Bournemouth, an ideal English health and holiday resort, amidst surroundings replete with historical associations. It is the Sandbourne of Thomas Hardy's "Tess of the D'Urbervilles," described by that great novelist as "a city of detached mansions; a Mediterranean lounging place on the English Channel. . . . Within the space of a mile from its outskirts every irregularity of the soil was prehistoric, every channel an undisturbed British trackway; not a sod had been turned since the days of the Cæsars."

On one side is the ancient port of Poole, once the haunt of smugglers, and intimately connected with the Newfoundland fishing trade; on the other Christchurch with its wonderful Norman Priory Church. A few miles inland is the unique Minster Church of Wimborne, the foundations of which were laid in the reign of Edward the Confessor. This contains a chained library dating from 1343. Not far westward are the ruins of Corfe Castle, where Edward the Martyr was murdered by Queen Elfrida in the year 978. This castle was rebuilt by William the Conqueror and partly destroyed during the civil wars of Cromwell's days.

The ever-glorious New Forest, that famous hunting-ground of Norman kings; Winchester and Salisbury with their magnificent old cathedrals; Stonehenge, the famous relic of the Druidical era; and Dorchester with its Roman amphitheater, are all easy of access.

Nor are up-to-date amenities lacking. The famous Municipal Orchestra, under Sir Dan Godfrey, plays daily at the Winter Gardens. There are two Municipal Golf Courses in the town, and other links in the vicinity, as well as ample provision for tennis and other games. The bathing facilities are excellent.

American and other tourists will find it a charming center, and may obtain the official guide, with illustrations, maps and information as to the many first-class hotels and boarding houses, from the Town Clerk, Town Hall, Bournemouth.



# Men may buy the coal but women pay for it

LOOK at your walls back of pictures, if you think your coal heated home is *clean!*

Start washing the woodwork and note the contrast. Give a party and count the days spent before in washing, scrubbing and dusting!

Then ask yourself if there is any special reason why your neighbor's wife who has an Oil-O-Matic should be relieved of this drudgery.

If you believe your family is comfortable with coal-heat, hide the shovel from your wife while you are downtown. Or start the furnace too early or too late in the fall. Then ask any Oil-O-Matic owner to tell you what comfort really means.

If you think coal isn't a nuisance, try leaving the house for a few days. Your wife can't leave it for five hours! But with Oil-O-Matic heat you may stay away for as long as you wish. You will never have to hurriedly leave a festive party to "fix the furnace."

Spasmodic coal heat is unhealthful. How many winters does your family go through without colds due to fluctuating temperature and drafty rooms?

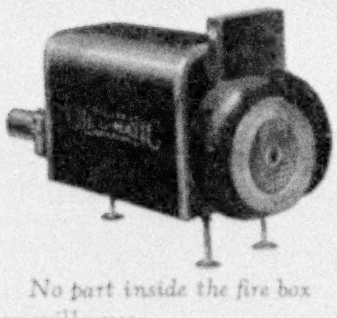
Compare your doctor bills with those who have Oil-O-Matic heat.

Yes, you may buy the coal, but your wife and family pay for it.

Selection of an oil burner for your house, doesn't require that you know anything about oil burning. Most owners of Oil-O-Matic couldn't tell you how it works. But they will hasten to tell you that it has never failed to work.

Your local oilomatician can tell you how much a guaranteed installation will cost in your heating plant. Whether it's steam, hot water or a warm air furnace. Let him explain his deferred payment plan that spreads the initial cost over a full year.

For the complete story, send the coupon below for "Heating Homes with Oil," and basement plan for ideal arrangement of space. It's sent free and postpaid.



*No part inside the fire box*

**WILLIAMS**
**OIL-O-MATIC**
**HEATING**
*World's Largest Producer of Automatic Oil Burners*

Williams Oil-O-Matic Heating Corp.
Bloomington, Illinois

Without obligation, please send me "Heating Homes with Oil," by return mail.

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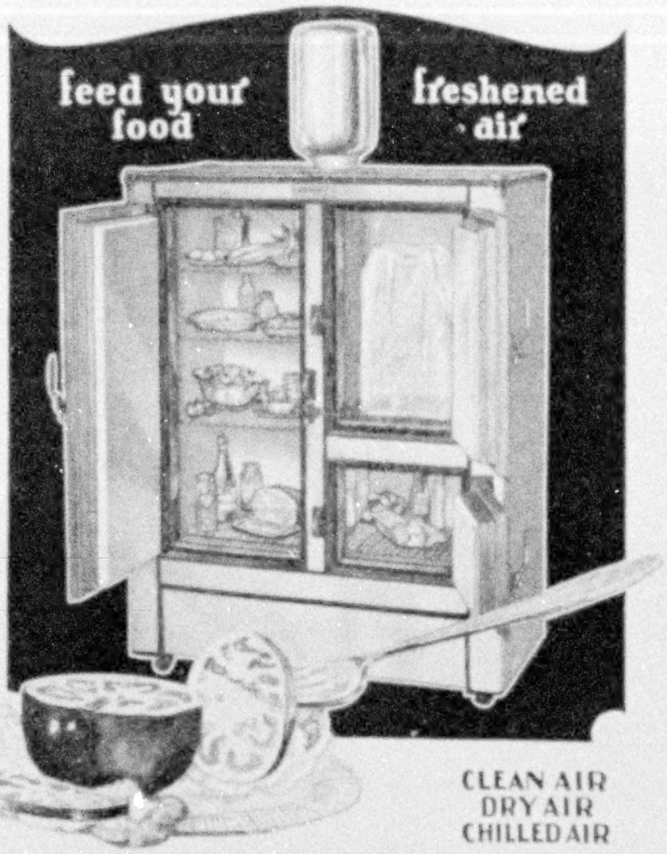
DE LUXE ALL PORCELAIN

# AUTOMATIC REFRIGERATORS



## *Your Salads—*
## *CRISPLY DELICIOUS*

CRISP, INVITING SALADS on sultry summer nights are so easy to serve when you have an Automatic. Drafts of clean, chilled air pass through the food chambers constantly. Your most perishable foods keep dainty and fresh in this sweet, icy atmosphere.

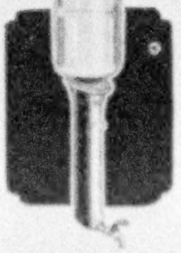
The De Luxe Automatic has a beautiful all-porcelain exterior and a one-piece porcelain lining with rounded corners. No seams or crevices. There will be room for everything without crowding in the oversize food chambers, fitted with non-rustable shelves, easily removable for washing.

The ice-wagon won't stop so often before your house, for the 16 walls of insulation make your ice last longer. Automatics are also offered with golden ash or Super-Steel casings. Outside icing if desired. All models are perfectly adaptable to electric refrigeration.

*Write for your dealer's name. Just send us your address. We want you to have our new folder describing the latest Automatic Refrigerators.*

ILLINOIS REFRIGERATOR COMPANY
Dept. 15-J, Morrison, Ill.

*Pure, Chilled Drinking Water —always ready*



*Convenient and Sanitary— Ice does double duty*

**ALSO CHILL YOUR DRINKING WATER**

*De Luxe All Porcelain*
**AUTOMATIC**
saves food · chills water
MORRISON ILLINOIS

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*Look Inside the Piano for this Trade Mark*

WESSELL, NICKEL & GROSS
NEW YORK
TRADE MARK

*The Sign of the World's Standard Piano Action*

## The World's Highest Priced Piano Action

IT is an obvious truth that products costing more are generally better in quality. Piano makers pay more for the Wessell, Nickel & Gross *piano action* than for *any other* piano action because they know it embodies a higher degree of quality.

When you insist on the Wessell, Nickel & Gross action in a piano or player you obtain the *world's highest-priced piano action* and all that this implies. In addition, you make certain of obtaining a *quality piano.* For the Wessell, Nickel & Gross action is found only in pianos of established worth.

WESSELL, NICKEL & GROSS
Established 1874 New York City

*When you Buy an Upright, Grand, Player or Reproducing Piano— Insist on the Wessell, Nickel & Gross Piano Action.*

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# Go! to Scenic Western Wonderlands

THE Missouri Pacific, D. & R. G. W., Western Pacific lines offer:

*Travel Comfort*
Two fast trains daily to Colorado, with thru sleepers to the Pacific Coast. Observation, compartment, drawing-room and open section sleepers to Colorado. Dining car service.

*Low Tourist Fares*
Exceptionally low round-trip fares available during summer season; return limit October 31.

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Through Royal Gorge, heart of the Rockies, Salt Lake City, colorful Feather River Canyon to the Golden Gate.

*Liberal Stop-overs*
You may stop-over anywhere en route, either way.

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A wealth of routes available for return trip; ask ticket agent.

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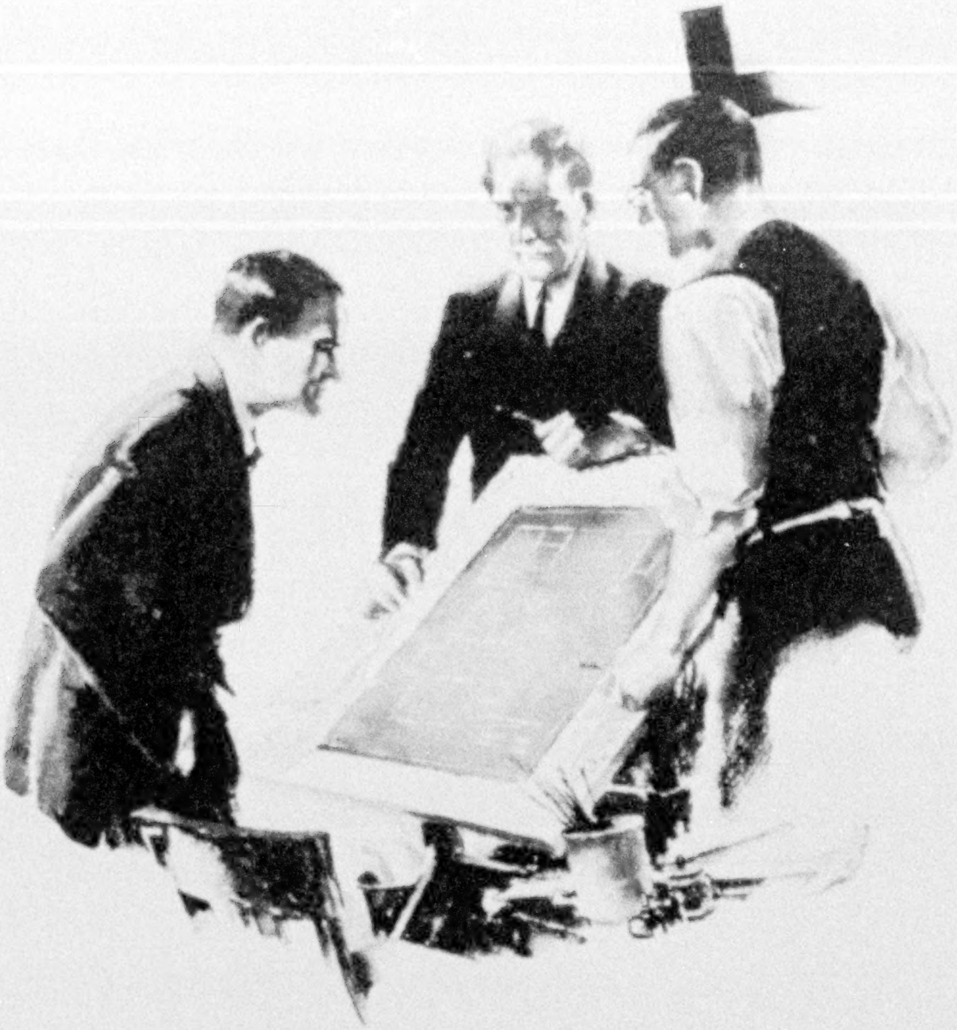
St. Louis, Mo.

MISSOURI PACIFIC LINES



"We always require an Ætna Surety Bond!" *A home to be built . . its cost, the savings of years . . a project that means everything . . will things go wrong? . . misunderstandings? . . extra bills of expense? . . unreasonable delay? . . Not when the contractor offers a surety bond for the faithful observance of his contract!*

Contractors who furnish Ætna Surety Bonds are good men to deal with. The very fact that they furnish an Ætna Bond is an assurance that they take their contracts, their responsibilities, seriously. For no one can have an Ætna Bond who is not worthy of your entire confidence.

And you have the additional surety that behind the work contracted for stand large and solid resources. For 75 years the name Ætna has stood as a synonym for the prompt and full payment of all just claims.

See that your building operations—home, factory or business block—are protected by Ætna Surety Bonds.

And see, too, that your family, your home, your business and your estate are protected by Ætna policies. Make the acquaintance of the Ætna-izer in your community today. He is a man well worth knowing. He is the representative of the strongest multiple-line insurance organization in the world.

The great Ætna organization offers you protection against virtually every known form of risk—offers you Life Insurance in all its branches, Accident and Health, Automobile, Liability, Compensation, Burglary, Fire and Marine, Fidelity and Surety Bonds.

Ætna-ize! According to your needs! As you prosper, and as your obligations increase!

ÆTNA-IZE

ÆTNA LIFE INSURANCE COMPANY AND AFFILIATED COMPANIES

*Ætna Casualty and Surety Co. Standard Fire Insurance Co. Automobile Insurance Co., of Hartford, Conn.*

REVEALS THE BEAUTY OF

*American Gumwood*

FORTUNATE is the home possessing paneling and other woodwork fabricated from this beautiful and distinctive hardwood. An elusive warmth of tone in the natural reddish-brown coloration suffuses itself through any finish applied. The effect is very delicate, further emphasized by a satin-like sheen peculiar to this wood.

Figured gumwood, ranging from highly ornate to unobtrusive ribbon-like patterns, may be used with plainer panels to provide a rich decorative effect. No cabinet wood offers more interesting possibilities.

What are known as the sap gum grades are ideal for built-in household conveniences, such as breakfast nooks, service cabinets, cozy corners, etc., where dark brown, gray, ivory, or enamel finishes are desired.

*Color finishes*

This twenty-four page illustrated booklet covers the accepted use of gumwood in furniture. It contains full-page color plates suggesting the decorative possibilities of this wonderful wood for paneling and interior woodwork. Free on request.

*Mail coupon today for this book*

GUMWOOD SERVICE BUREAU OF THE HARDWOOD MFRS. INSTITUTE
Bank of Commerce Bldg., Memphis, Tenn.

Please send me your free booklet "Beautiful American Gumwood."

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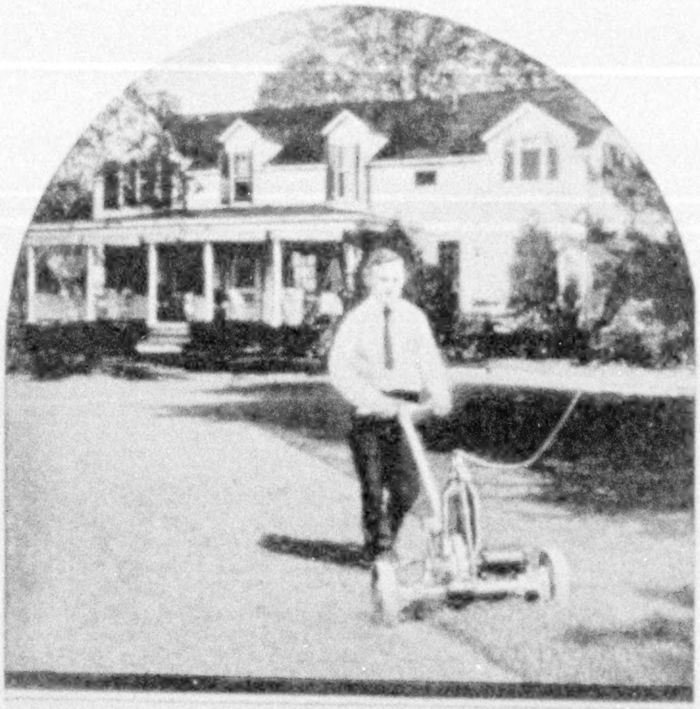


*Have You Seen the*
**ELECTRIC LAWN MOWER?**

THE latest electrical labor saving development. Does away with the drudgery of pushing the lawn mower. As easy to operate as a vacuum cleaner. Propels itself and mows as it goes. All the operator has to do is steer it. Simple—clean—quiet. Connects to any garage or house light socket (on either direct or alternating current) and uses about the same amount of current as an electric iron. Carries 150 feet of cable (allowing a 300 foot cutting radius) on a friction reel, which takes up and pays out automatically, thus keeping the cable tight and out of the way of the machine and the operator. Cuts a 21 inch swath—1/4 of an acre an hour. Mower by Coldwell—Motor by General Electric. Timken tapered roller bearings and cut steel gears run in oil. See it in action today, at your hardware dealer's. Send for detailed information and literature on the Coldwell Electric Lawn Mower.

SINCE 1867
COLDWELL
DEPENDABLE
LAWN MOWERS
*Hand · Horse · Gasoline · Electric*

COLDWELL LAWN MOWER CO., NEWBURGH, N. Y.

# 70 out of every 100 men at Yale shave with a—Gillette

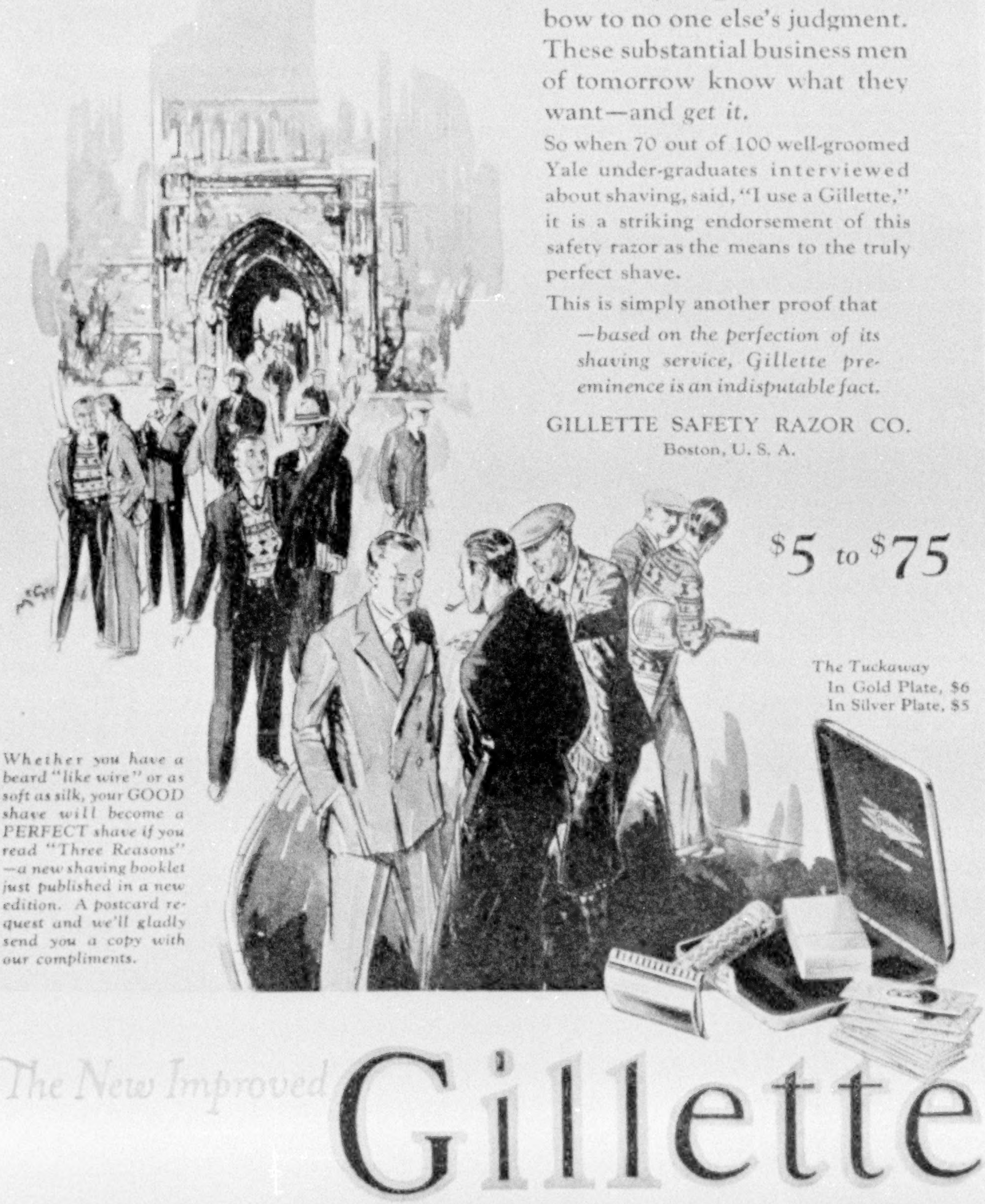
In matters affecting personal taste, young men of today bow to no one else's judgment. These substantial business men of tomorrow know what they want—and *get it.*

So when 70 out of 100 well-groomed Yale under-graduates interviewed about shaving, said, "I use a Gillette," it is a striking endorsement of this safety razor as the means to the truly perfect shave.

This is simply another proof that

*—based on the perfection of its shaving service, Gillette pre-eminence is an indisputable fact.*

GILLETTE SAFETY RAZOR CO.
Boston, U. S. A.



$5 to $75

*The Tuckaway*
In Gold Plate, $6
In Silver Plate, $5

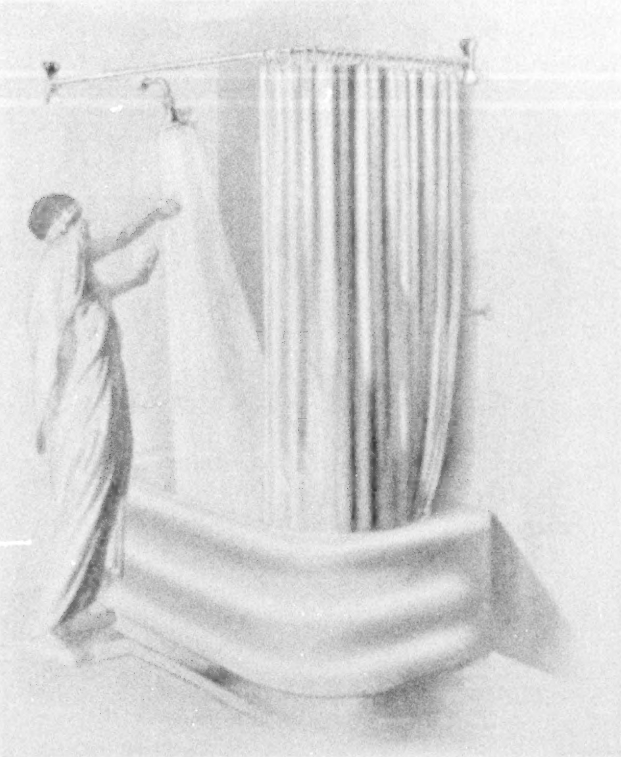
*Whether you have a beard "like wire" or as soft as silk, your GOOD shave will become a PERFECT shave if you read "Three Reasons"—a new shaving booklet just published in a new edition. A postcard request and we'll gladly send you a copy with our compliments.*

*The New Improved* Gillette

SAFETY —Gillette— RAZOR

THE QUALITY RAZOR OF THE WORLD

When you want to put the shower over the tub



*—This H 2370 has proven itself the ideal combination*

THE temperature of the shower is under instant control through the single handle of the Mixometer. At the same time, the lever handle in the Anyforce shower head permits the volume to be regulated instantly, to suit the fellow who "likes it on full", or toned down for the women, older folks and children.

This shower is connected up with the bath valves, this connection being made right in our plant where everything is tested under heavy water pressure before being sent out. We test even the waste parts.

The combination of H 952½ Mixometer Shower and Deshler Bath Fixture—together the H 2370—which we show here, is described in a booklet which we will gladly send you. Various other types of Speakman Showers, Bath, Lavatory and Sink Fixtures also are shown and described. Use the coupon, if more convenient.

SPEAKMAN COMPANY
Wilmington, Delaware

SPEAKMAN SHOWERS
and FIXTURES

SPEAKMAN COMPANY, Wilmington, Del.

Please send me literature on Speakman Showers and One-Nozzle Fixtures.

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*"Niagara to the Sea"*

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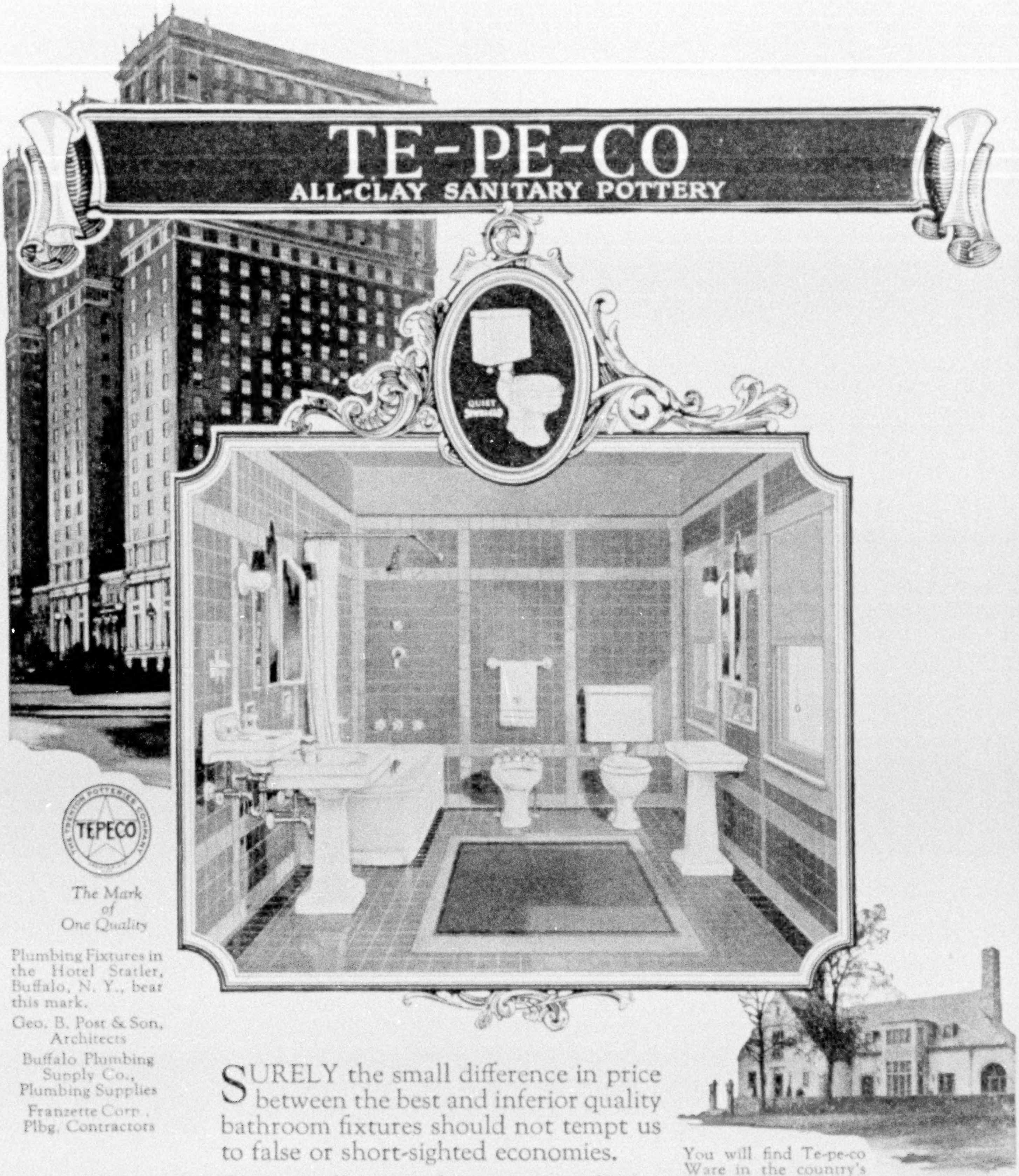
# TE-PE-CO

## ALL-CLAY SANITARY POTTERY



TEPECO

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Plumbing Fixtures in the Hotel Statler, Buffalo, N. Y., bear this mark.

Geo. B. Post & Son, Architects

Buffalo Plumbing Supply Co., Plumbing Supplies

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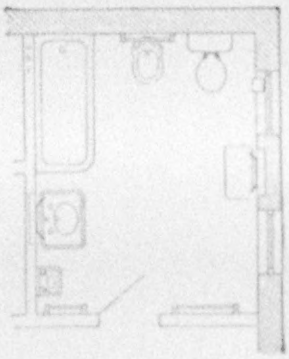
SURELY the small difference in price between the best and inferior quality bathroom fixtures should not tempt us to false or short-sighted economies.

The installation of Te-pe-co All-Clay Plumbing Fixtures insures a bathroom whose beauty, sanitation and comfort last as long as the building stands. Is it either economy, good sense or good business to be satisfied with any fixtures less permanent?

The Te-pe-co line allows of a wide price range, owing to a great variety of designs and sizes. But there is only one Te-pe-co standard of excellence.

You will find Te-pe-co Ware in the country's finest residences as well as in our famous buildings. Many bathroom designs with practical floor plans as shown here are contained in our book "Bathrooms of Character," T-4. Send 10 cents for copy.



*Write for literature*

**The Trenton Potteries Company**

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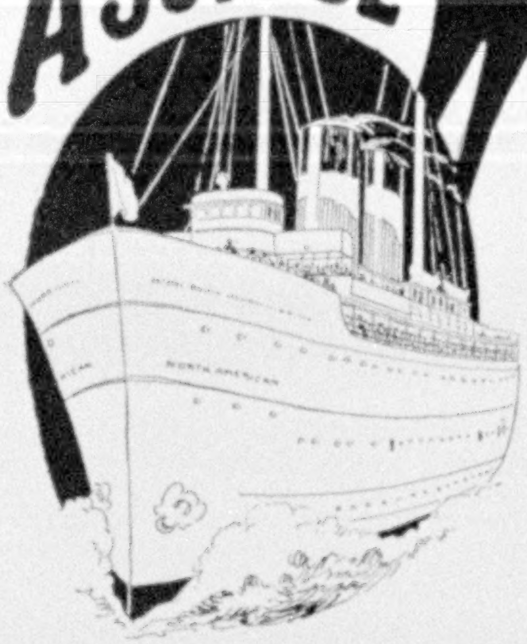
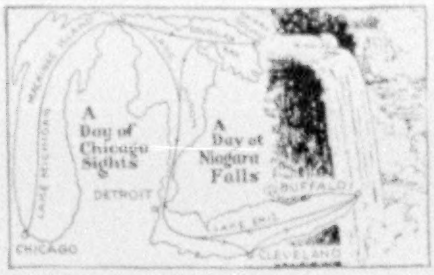
NEW YORK PHILADELPHIA BOSTON SAN FRANCISCO

*World's Largest Makers of All-Clay Plumbing Fixtures*





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*with a full day at Niagara Falls*

$77.50 *Meals and Berth Included*

The Great Oil-Burning White Liners
**North American and South American**

A trip of over 2,000 miles with alluring scenery enroute—new experiences and thrills. Plenty of time allowed at all points of interest to see the sights.

Semi-Weekly Sailings from Chicago, Buffalo, Detroit, Cleveland & Return

*Tickets bearing rail routing between Chicago, Buffalo, Detroit and Cleveland will be honored for transit upon additional payment.*

**Call or write for pamphlet at any Railway Ticket Office or Tourist Agency or**

**Chicago, Duluth & Georgian Bay Transit Co.**

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These Great Cruising Ships

in comfort and luxury are equal to the finest Atlantic Liners. Promenade and Sun Decks of unusual width; Large Grand Salon and Lounge Rooms; Canopy Covered Palm Garden. All Staterooms and Parlor Rooms are outside rooms with windows or port holes. Bath and toilet in connection with Parlor Rooms and convenient to all Staterooms. Excellent meals of pleasing variety, daintily served. Plenty of restful nooks for those who seek quiet. For those who enjoy gaiety there are Deck Games, Entertainment, Music and Dancing, with a Social Hostess to look after the Enjoyment of Guests. Open air playground screened in with attendant to amuse the children.

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*Requirements Vary-Glasses Vary*
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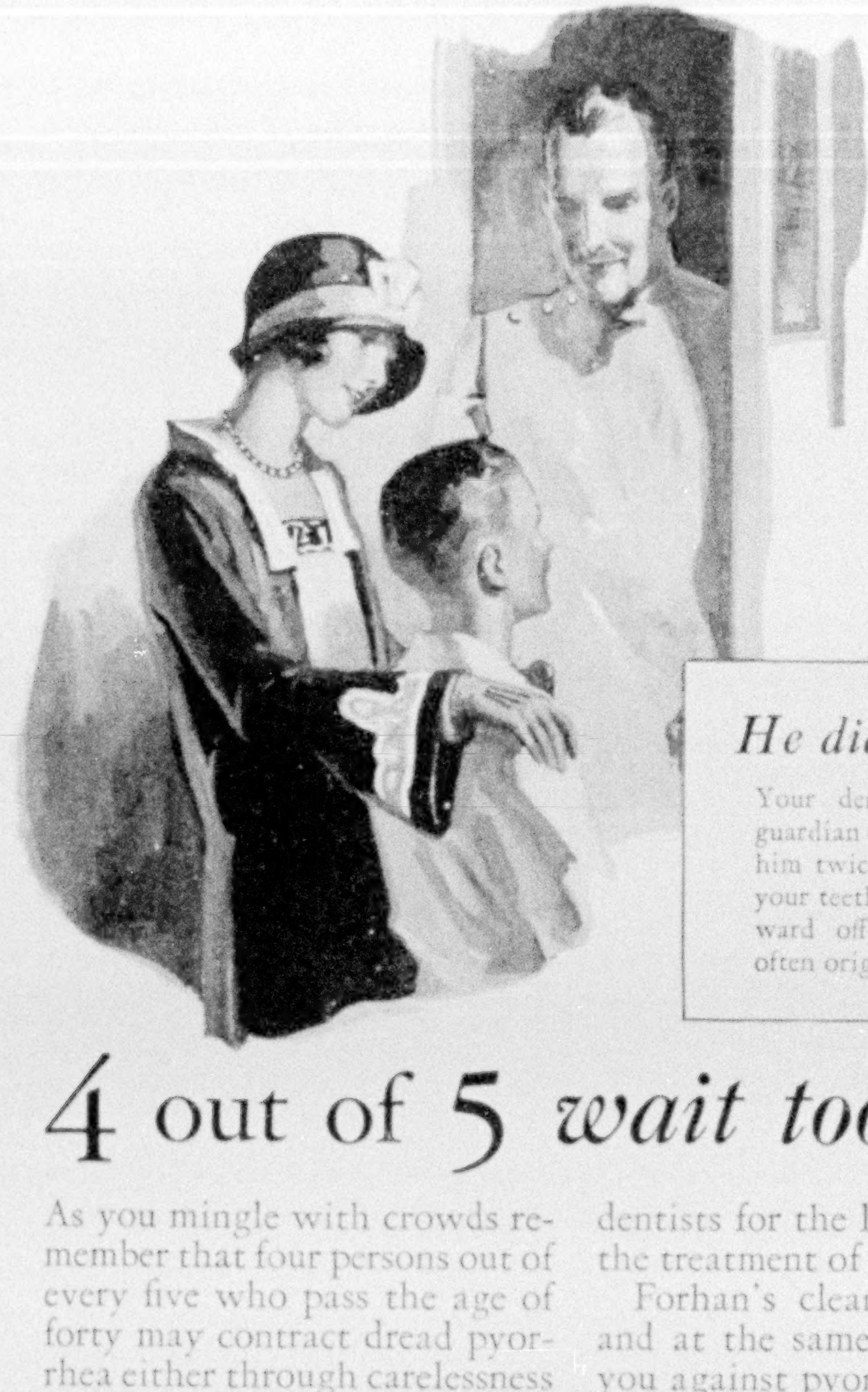
WATRY & HEIDKAMP, Dept. 12-F, 17 W. Randolph St., Chicago
*Chicago's Leading Optical House Since 1883*

**Quality in a small Power Mower**

A worthy member of the famous Jacobsen line, which includes a power mower for every type of lawn. The "Junior" mower cuts a 19-inch swath at the rate of two acres a day on a gallon of gas. Suitable for moderately large lawns. Efficient on terraces—steers easier than a hand mower. Has self-sharpening device. Fully guaranteed—attractively priced. Write for literature today.

**Jacobsen Mfg. Co.**
Dept. RR Racine, Wisconsin
Eastern Office, 245 W. 55th St.
New York City

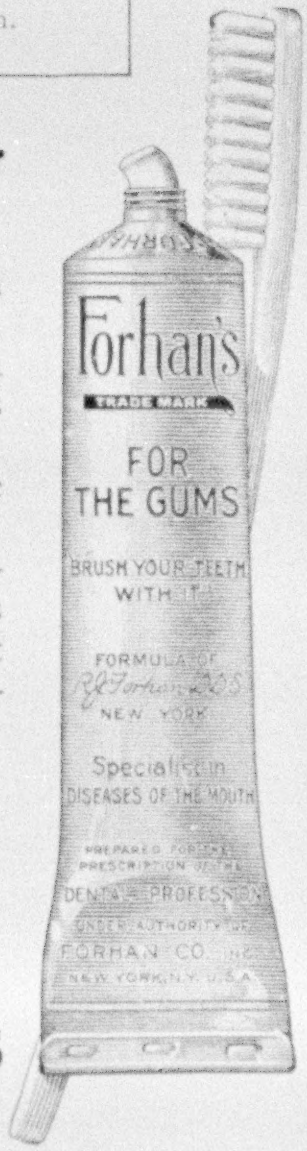
**Jacobsen "Junior" Power Lawn Mower**



*He didn't hurt a bit!*

Your dentist is an important guardian of your health. Consult him twice a year. He can keep your teeth and gums healthy and ward off serious sickness that often originates in the mouth.

# 4 out of 5 *wait too long*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TRADE MARK
FOR THE GUMS
BRUSH YOUR TEETH WITH IT
FORMULA OF
R.J. Forhan D.D.S.
NEW YORK
Specialist in
DISEASES OF THE MOUTH
PREPARED FOR THE PRESCRIPTION OF THE
DENTAL PROFESSION
UNDER AUTHORITY OF
FORHAN CO. INC.
NEW YORK, N.Y. U.S.A.

As you mingle with crowds remember that four persons out of every five who pass the age of forty may contract dread pyorrhea either through carelessness or ignorance.

At the first sign of tender bleeding gums go to your dentist at once for an examination and start using Forhan's for the Gums.

If used regularly and used in time Forhan's will prevent pyorrhea or check its progress. Ask your dentist about Forhan's for the gums. He will undoubtedly recommend it as your regular dentifrice. It contains a percentage of Forhan's Pyorrhea Liquid which has been used by dentists for the last 15 years in the treatment of pyorrhea.

Forhan's cleanses the teeth and at the same time protects you against pyorrhea.

You can't afford to gamble with your health and happiness. Don't wait for pyorrhea's symptoms. Stop at your druggist's for a tube of Forhan's and start playing safe today! All druggists, 35c and 60c in tubes.

*Formula of R. J. Forhan, D. D. S.*
Forhan Company, New York

## Forhan's
**FOR THE GUMS**

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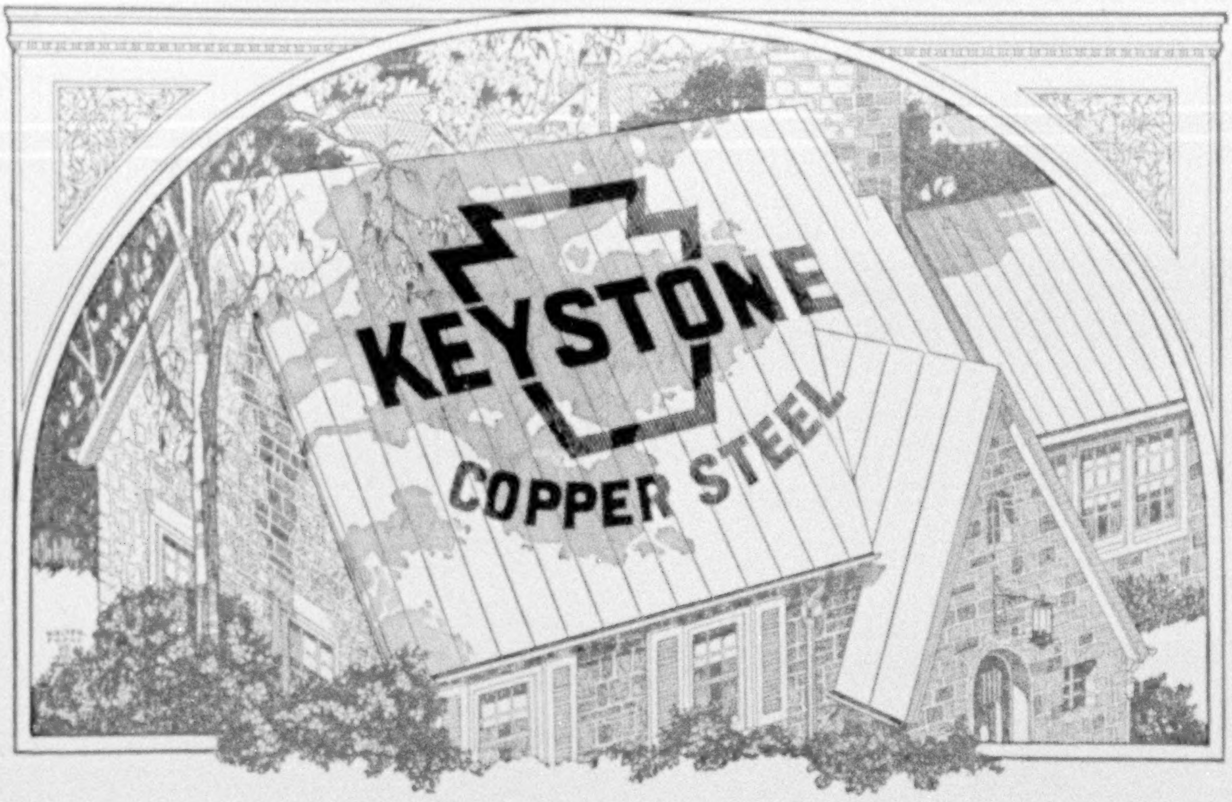
6-26



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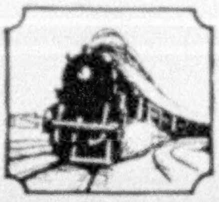

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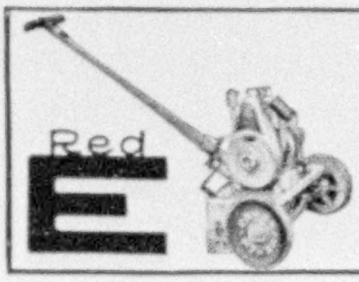

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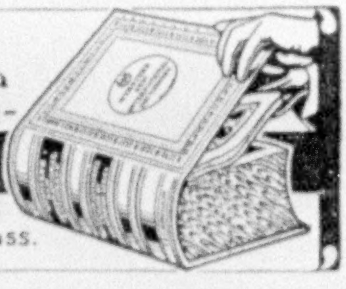

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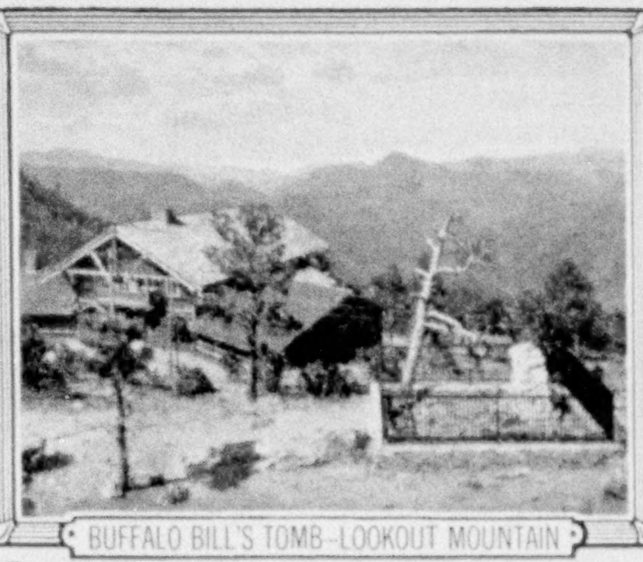

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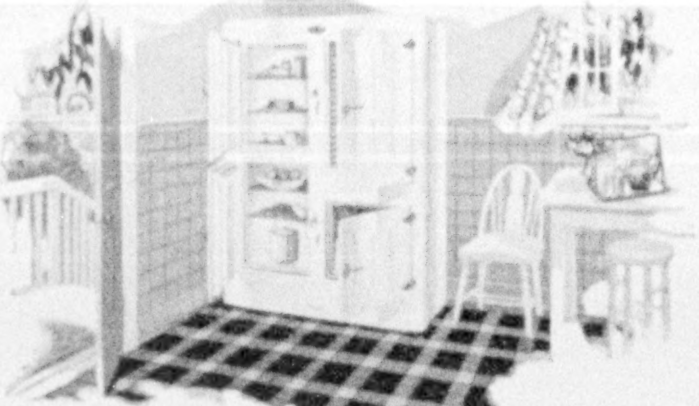

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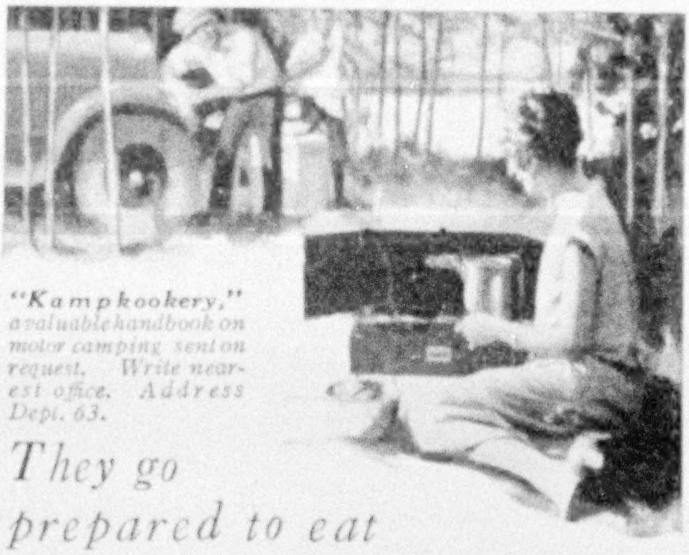

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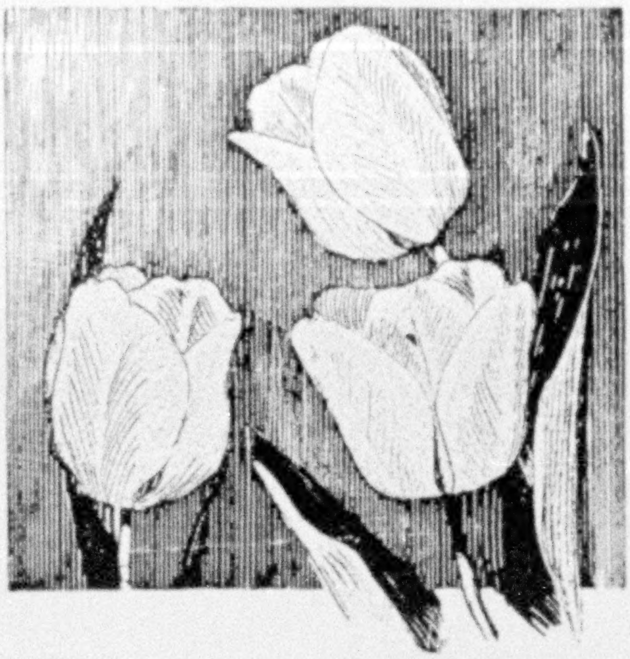

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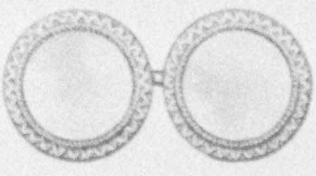

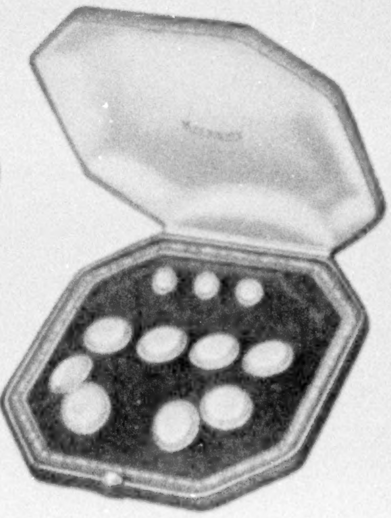

This link shows the design of Full Dress Set illustrated—No. 1488, White Mother-of-Pearl Centers, Rolled White Gold Plate Rims. Consists of pair of links, 3 studs, 4 vest buttons. Price, complete, $11.50.

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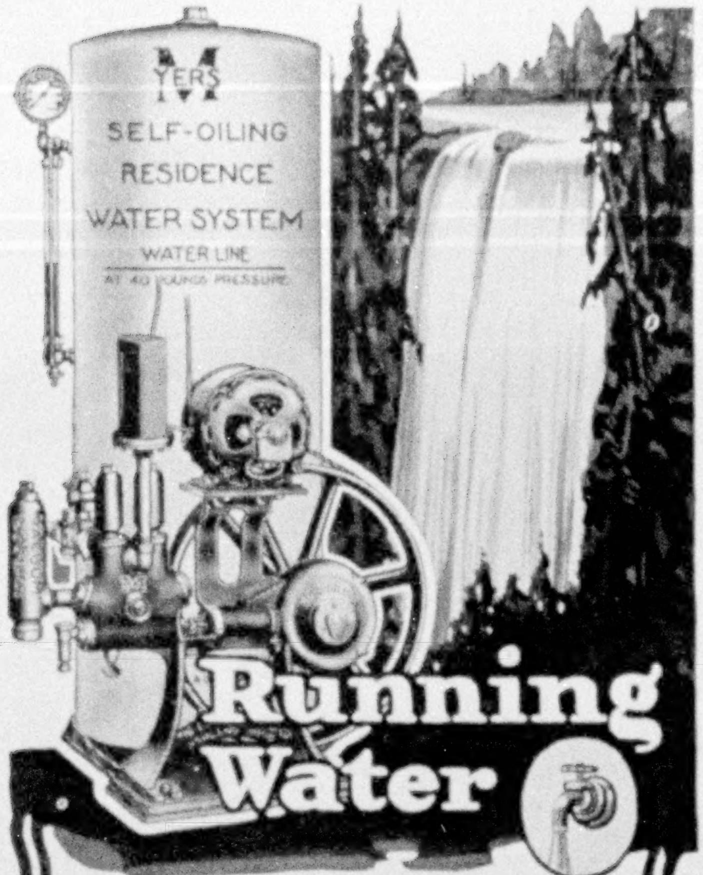

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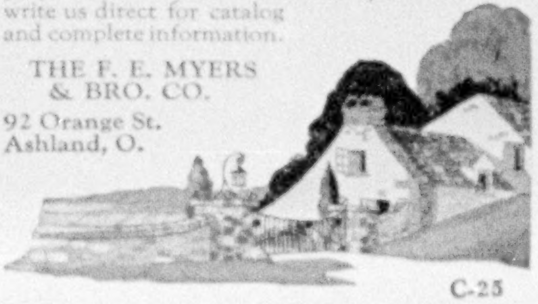

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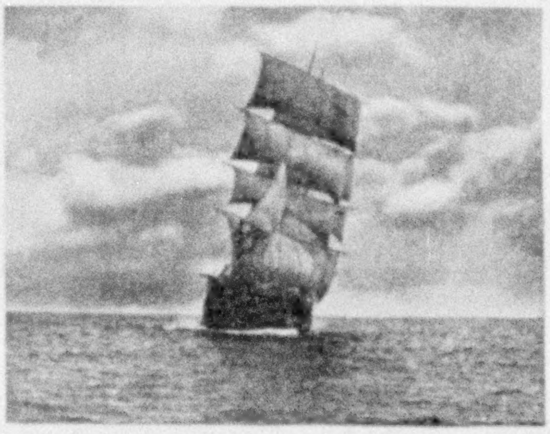

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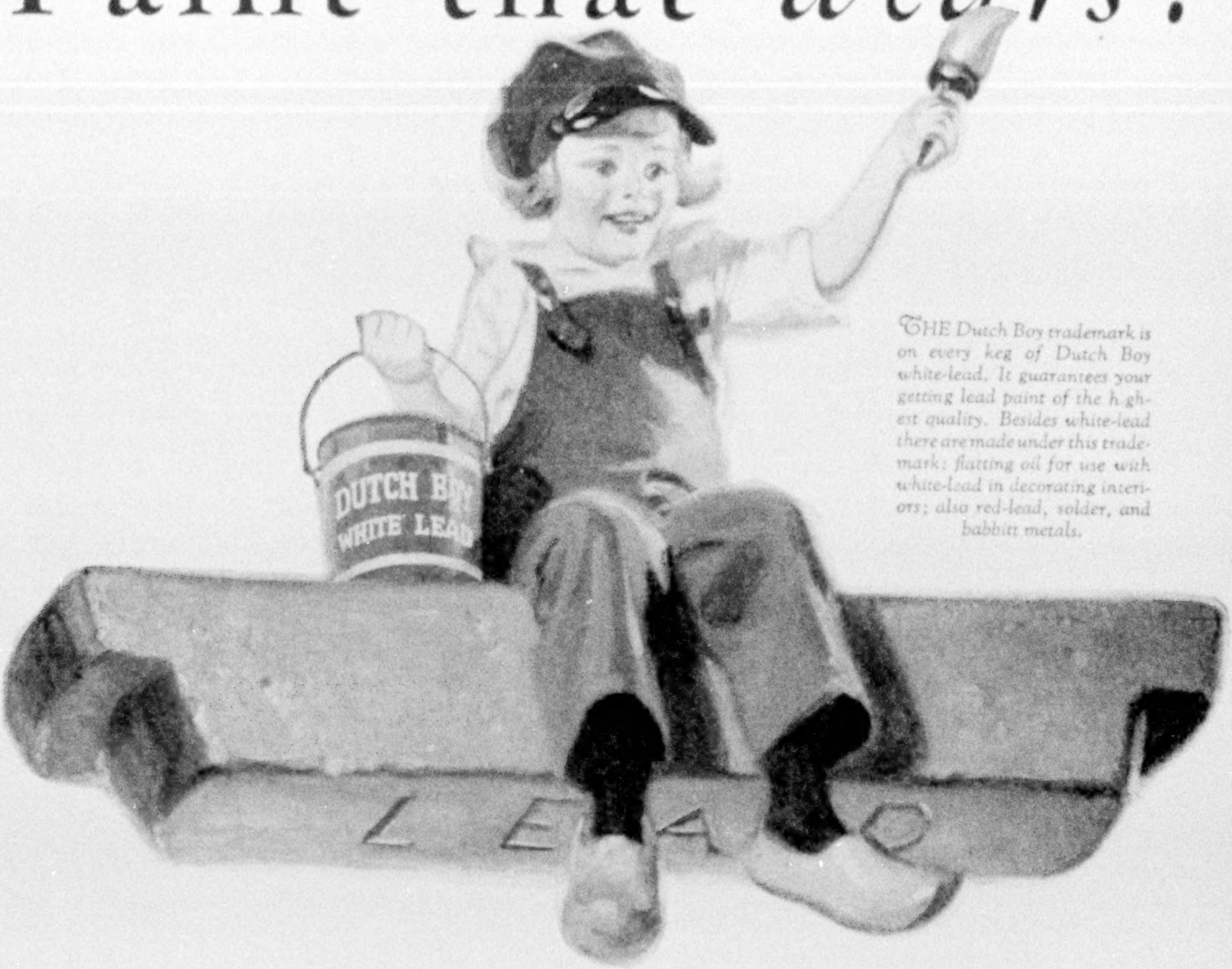
WASHINGTON, D. C.

# Paint that *wears!*



*THE Dutch Boy trademark is on every keg of Dutch Boy white-lead. It guarantees your getting lead paint of the highest quality. Besides white-lead there are made under this trademark: flatting oil for use with white-lead in decorating interiors; also red-lead, solder, and babbitt metals.*

PAINT has a hard life. Storms rage against it. The sun beats down mercilessly on it. The important question is, "What paint can I use which best resists the attacks of the weather?"

To many house-owners the outstanding fact about Dutch Boy white-lead paint is its ability to stand up against the weather. This paint made of Dutch Boy white-lead and pure linseed oil wears—and wears—and *wears*. Property-owners use it, not only because it protects their property against decay, but because its protection lasts for a longer time.

You have a right to expect unusual durability from Dutch Boy white-lead paint. Its tough, moisture-proof, elastic film is long-term insurance against decay. It protects property and keeps it protected. It is an all-lead paint, and it is the lead which gives paint its weather-resisting qualities.

Invest in Dutch Boy white-lead paint the next time you paint. You can get at a remarkably reasonable cost the complete protection this paint gives. One hundred pounds of Dutch Boy white-lead makes seven gallons of pure lead paint. The great economy of this paint becomes more evident each succeeding year, as you save the cost of frequent repaintings and avoid the expense of repairs which are sure to come if a house is not kept painted. Remember, too, that an improperly painted house always deteriorates both in appearance and value.

"Decorating the Home" is a new free booklet, illustrated in color, which suggests decorative treatments for exteriors and interiors. A copy will be sent you if you write our nearest branch. If you are planning to decorate your home, write our Department of Decoration in care of our nearest branch office. Specialists in color will help you without charge to plan distinctive color treatments.

"Save the surface and you save all"

NATIONAL LEAD COMPANY

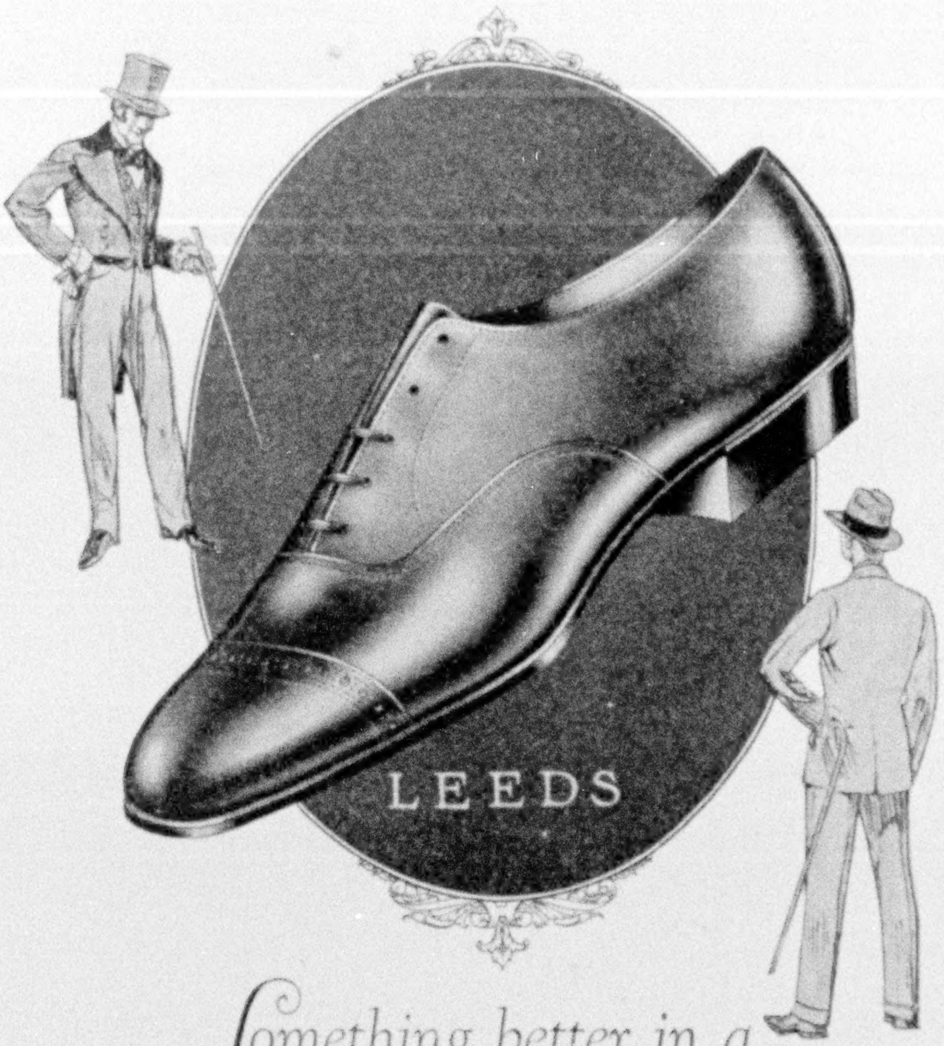
New York, 111 Broadway; Boston, 131 State Street; Buffalo, 116 Oak Street; Chicago, 900 West 18th Street; Cincinnati, 659 Freeman Avenue; Cleveland, 820 West Superior Avenue; St. Louis, 722 Chestnut Street; San Francisco, 485 California Street; Pittsburgh, National Lead & Oil Co. of Pa., 316 Fourth Avenue; Philadelphia, John T. Lewis & Bros. Co., 437 Chestnut Street.

## Dutch Boy White-Lead

*Makes an all-lead paint*

*Partial list of the Banister dealers able to serve you*

Crittenden Bootery, Birmingham, Ala.
Silverwoods, Inc., Los Angeles, Cal.
Kambara Shoe Co., Sacramento, Cal.
Frank Werner Co., San Francisco, Cal.
Davis & Savard, Bridgeport, Conn.
Eli Boot Shop, New Haven, Conn.
John McElligott, Waterbury, Conn.
The Bootery, Daytona, Fla.
Burdine Bootery, Miami, Fla.
The Hub, Ft. Lauderdale, Fla.
Kouns & Jones, Bradentown, Fla.
Ray Bros., Atlanta, Ga.
B. H. Luers & Sons, Springfield, Ill.
Armstrong Clothing Co., Cedar Rapids, Ia.
The Utica, Des Moines, Ia.
E. & W. Clothing House, Sioux City, Ia.
C. A. Stanton's Sons, Madison, Ind.
Byck Bros. & Co., Louisville, Ky.
Mayer Israel & Co., New Orleans, La.
McDowell & Black Shoe Co., Portland, Me.
Coes & Young Co., Boston, Mass.
D. F. Sullivan, Fall River, Mass.
Clement Co., Springfield, Mass.
The Hub, Baltimore, Md.
Leiter's Men's Shop, Hagerstown, Md.
J. L. Hudson Co., Detroit, Mich.
L. S. Donaldson Co., Minneapolis, Minn.
Palace Clothing Co., Kansas City, Mo.
Plymouth Clothing Co., St. Joseph, Mo.
Swope Shoe Co., St. Louis, Mo.
M. E. Blatt Co., Atlantic City, N. J.
Smashey's, Bridgeton, N. J.
Geo. W. Melick, Morristown, N. J.
N. C. Smith & Co., Ocean City, N. J.
Max Kroll, Passaic, N. J.
Smith Shoe Shop, Paterson, N. J.
Nassau Boot Shop, Princeton, N. J.
M. & P. Urken, Trenton, N. J.
Geo. W. Goetz, Amsterdam, N. Y.
Parker & Diemer, New York City
Wm. Morgan Sons, Inc., New York City
Frederick Loeser & Co., Brooklyn, N. Y.
Ashdown Boot Shop, Ithaca, N. Y.
Palace Shoe Store, New Rochelle, N. Y.
Casey Bros., Rome, N. Y.
Gould, Lee & Webster, Rochester, N. Y.
Tector's, Utica, N. Y.
J. E. & H. E. Reeves, Watertown, N. Y.
H. Weil & Bros., Goldsboro, N. C.
Vanstory Clo. Co., Greensboro, N. C.
Smith-Kasson Co., Cincinnati, Ohio
Wm. Taylor Son & Co., Cleveland, Ohio
Rike-Kumler Co., Dayton, Ohio
E. R. Ebner & Son, London, Ohio
S. C. Lauber, Toledo, Ohio
Lustig Bros., Youngstown, Ohio
Whiteman & Simpson, Ardmore, Okla.
Salmas' Quality Store, Ambler, Pa.
Farr Bros. Co., Allentown, Pa.
Farr Bros. Co., Bethlehem, Pa.
Lytle Bros., Clearfield, Pa.
Farr Bros. Co., Easton, Pa.
Pomeroy's, Inc., Harrisburg, Pa.
Schwartz Bros., Johnstown, Pa.
N. T. Marsh, Milton, Pa.
Strawbridge & Clothier, Philadelphia, Pa.
Farr Shoe Co., Reading, Pa.
F. E. Geiger, Williamsport, Pa.
Simon Long's Sons, Wilkes-Barre, Pa.
Sullivan Co., Providence, R. I.
Cook & Love, Memphis, Tenn.
Hurst Bros., Dallas, Tex.
Jolesch Shoe Co., Ennis, Texas
Sanger Bros., Ft. Worth, Texas
Shotwell's, Houston, Texas
Fomby Clothing Co., San Antonio, Texas
Miller Cross Co., Waco, Texas
Bluefield Shoe Co., Bluefield, W. Va.
Highland Bros. & Gore, Clarksburg, W. Va.
E. Mosher, Inc., Rawlins, Wyo.



## Something better in a "summer weight" shoe

The Leeds is the final word in ease with an outstanding smartness peculiarly its own. Essentially a young man's shoe, it is a great favorite with men who, regardless of years, have the happy faculty of seeming younger and feeling it, too.

"Light as a feather" and with Banister materials, Banister workmanship and, above all, Banister style, it reveals the eighty-one years of fine shoe-making that have preceded it in Banister history.

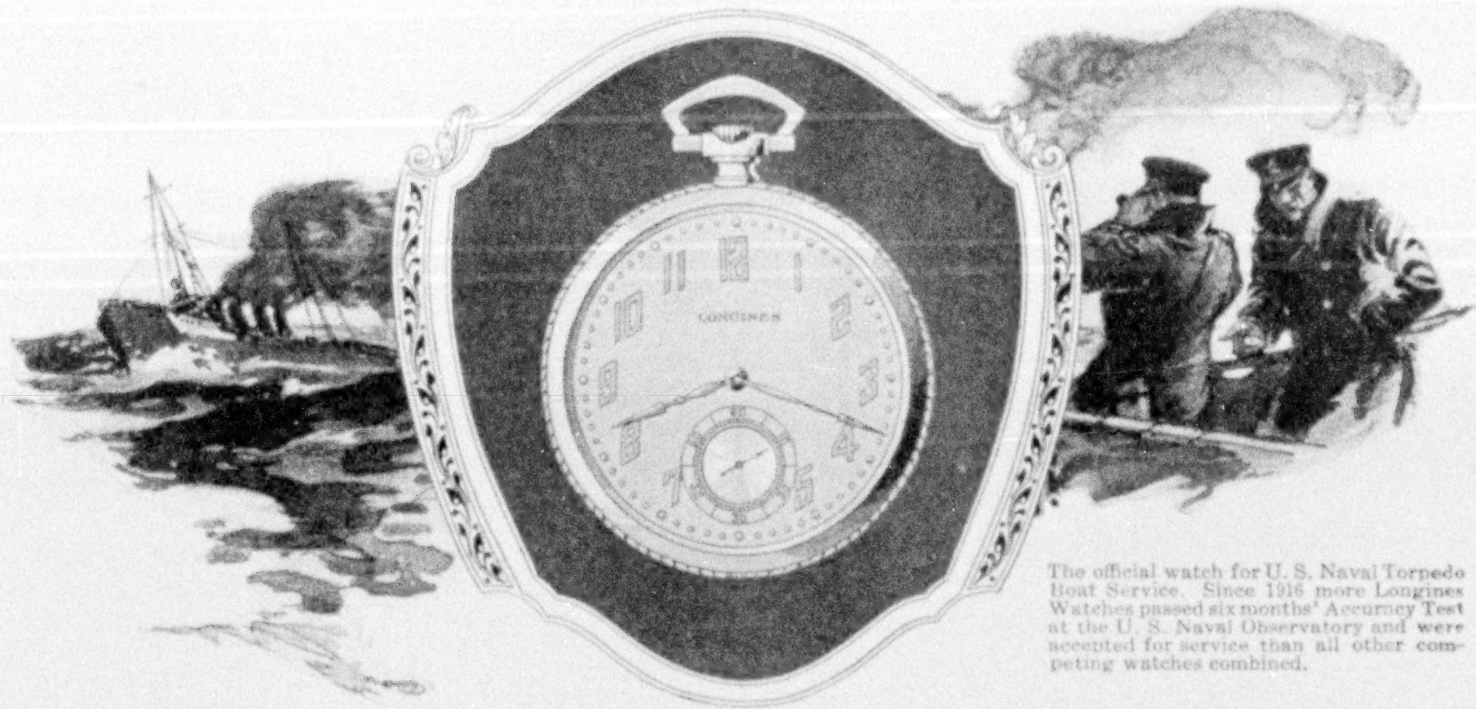
Banister Shoes retail from $12.50 to $20 a pair.

*Write for booklet illustrating the latest styles of Banister Shoes.*

JAMES A. BANISTER COMPANY
NEWARK, NEW JERSEY

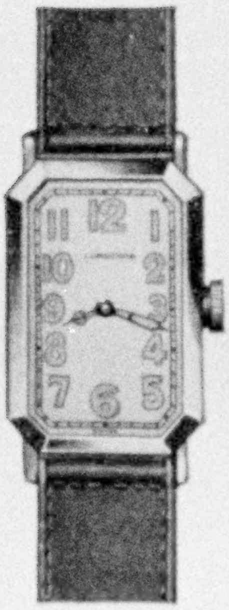
Since 1845 the Choice of Gentlemen

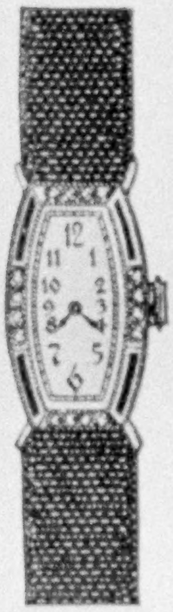
# BANISTER SHOES



The official watch for U. S. Naval Torpedo Boat Service. Since 1916 more Longines Watches passed six months' Accuracy Test at the U. S. Naval Observatory and were accepted for service than all other competing watches combined.

# "Who sells it?" is often the vital reason to buy

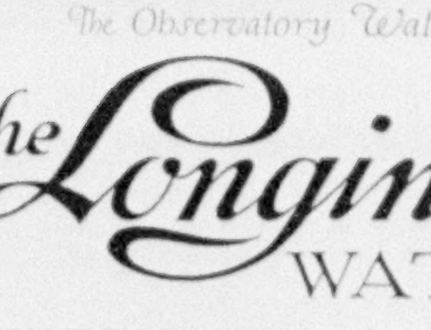




Certain jewelers have built up wonderful reputations because of the goods they sell. They choose merchandise as carefully as they choose men for the most responsible positions in their establishments. Almost always these are the finest stores—usually the leading jewelry stores.

Such jewelers feature Longines Watches. They know that Longines have made the greatest records for accuracy in competition with the world's best watches—not just in one country or in makers' tests—but in world-famous observatories all over the world with government officials in full charge of the tests.

You can rely on the judgment of these jewelers. You may buy a Longines knowing that the store which sells it to you is placing in your hands the most accurate watch — and their own reputation. You can buy a Longines for $35 or $1000. Write for a booklet showing the many beautiful models.



*The Observatory Watch*

## The Longines WATCH

A. WITTNAUER COMPANY

*Established 1866*

New York
Chicago

30 WEST 36th ST., NEW YORK

Montreal
Geneva

*Official Government Observatory Awards*

*At Geneva Observatory—Switzerland:* In 1925 Longines again received first prize of series, duplicating results of 1923 and 1924; also obtained many additional individual prizes.

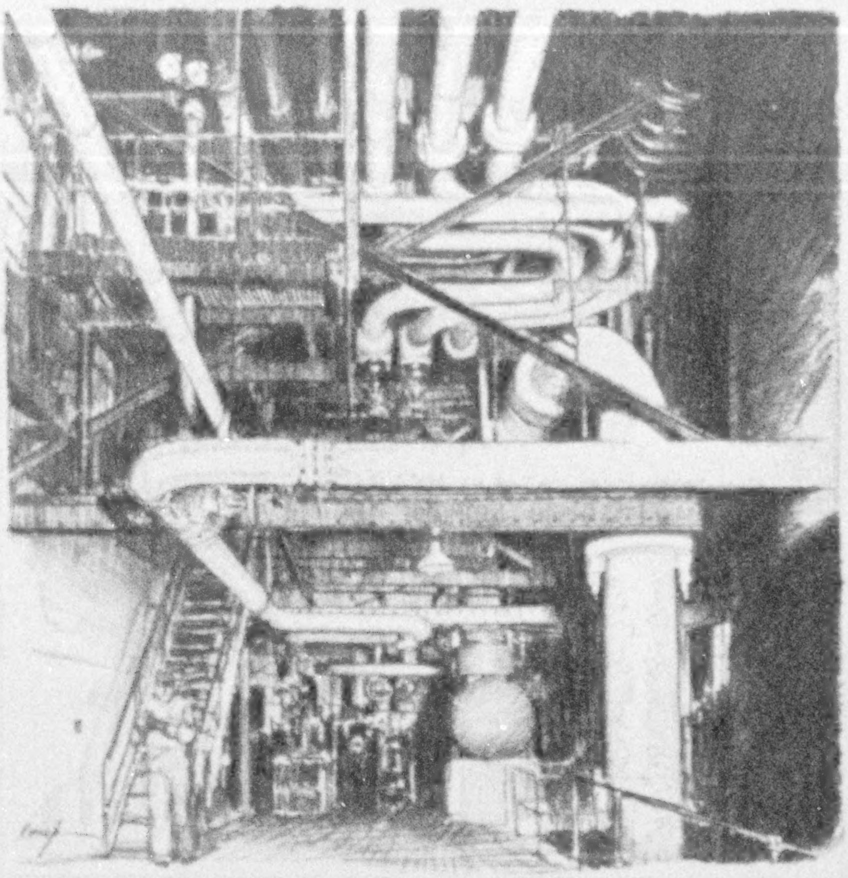
*At Neuchatel Observatory—Switzerland:* Since 1905 Longines have received 397 awards in Accuracy Contests. During 1924 and 1925 21 first prizes.

*At Kew Teddington Observatory—England:* 141 awards in Accuracy Contests since 1910 (1918 year's record for the best performance). Since 1919 every Longines Watch submitted passed trial with mention "especially good".

Also received seven grand prizes at International Exhibitions.

PRESS OF JUDD & DETWEILER, INC.
WASHINGTON, D. C.

· · CRANE VALVES · ·



A view in the header room, Crawford Avenue Station of Commonwealth Edison Company, Chicago. Two 50,000 kw. and one 60,000 kw. turbo-generators are served by 15 boilers already installed. A 77,000 kw. turbo-generator and 5 more boilers now being added. Pressure 600 pounds; temperature 750°. Sargent and Lundy, Chicago, engineers. Graham Anderson Probst and White, architects. Piping installed by W. A. Pope, Chicago.

# To meet electrical power needs in 1955

UP, up, up, go steam pressures and temperatures to help give you current at lower cost. The prevailing steam pressures when Crane Co. was founded in 1855 were 35 to 50 pounds to the square inch. Today, the Crawford Avenue Station of the Commonwealth Edison Company, Chicago, operates at 600 pounds. What will pressures be in 1955?

The answer will come as engineers, in pursuit of increased operating efficiency, specify higher pressures and temperatures. Always, the Crane chemical and metallurgical laboratories are abreast of their demands. With confidence, they look to Crane for safe materials. For as pressures and temperatures are increased to save coal, new hazards come, greater strains on metals that lose strength as temperatures rise. So the prime requirement is safety, safety of plant and safety of human life. To this responsibility of supplying safe piping equipment to hold in leash the tremendous power of high pressures and superheat, Crane experience and research are dedicated.

For dependability of product for the purpose always specify Crane

To serve every human activity, there are Crane products precisely engineered for their particular tasks. You may need giant valves for waterworks, power plant, or oil field; or only a small faucet to control running water. Crane makes them all in many types and sizes: for safety, dependability, and economy.

# CRANE

**PIPING MATERIALS TO CONVEY AND CONTROL STEAM, LIQUID, GAS, OIL**

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